ORDER NO. AD9005117C8

Service Manual

Compact Disc Player

SL-PJ324

Color

(K)... Black Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

SL-P333 MECHANISM SERIES (SIWD 113-ZA)

SPECIFICATIONS

■ **Audio**

No. of channels	2 (left and right, stereo)
Frequency response	2–20,000 Hz, ±1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	94 dB
S/N ratio	96 dB
Wow and flutter	Below measurable limit
Output impedance	Approx. 1 kΩ
Load impedance	More than 10 kΩ

■ **Pickup**

Wavelength	780 nm

■ **General**

Power supply	
For Continental Europe:	AC 50/60 Hz, 220 V
For Oceania:	AC 50/60 Hz, 240 V
For others:	AC 50/60 Hz, 110 V/127 V/220 V/240 V
Power consumption	10 W
Dimensions (W×H×D)	360×95.8×290.5 mm
Weight	3.4 kg

Specifications subject to change without notice.
Weight and dimensions shown are approximate.

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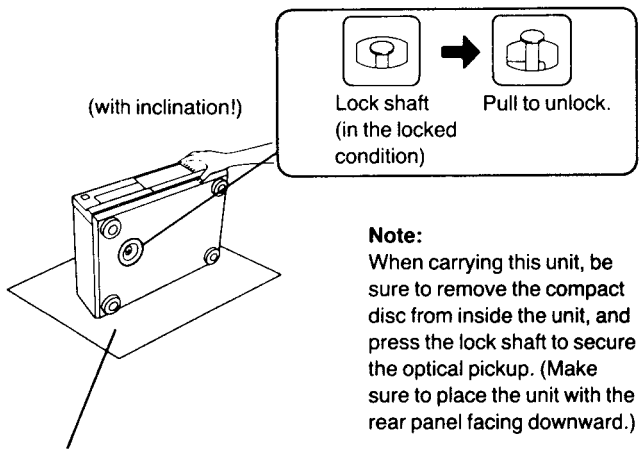
Panasonic®

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

■ PLACEMENT

Before placement

The optical pickup is secured to prevent damage during transport. Be sure to release it before use.



Note:
When carrying this unit, be sure to remove the compact disc from inside the unit, and press the lock shaft to secure the optical pickup. (Make sure to place the unit with the rear panel facing downward.)

Notes of placement

■ **This unit is a precision instrument. Be sure to place it on a flat surface.**

■ **Avoid places such as the following:**

- Near any equipment or device that generates strong magnetism.
- On any heat-generating equipment or device, or in any place where the temperature is high (35°C or higher).
- Extremely cold places (5°C or below).
- Near a tuner or TV (It may cause noise in the broadcast, or disturbance of the TV picture.)

■ **When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.**
Always remove the disc before storing the unit for any period of time.

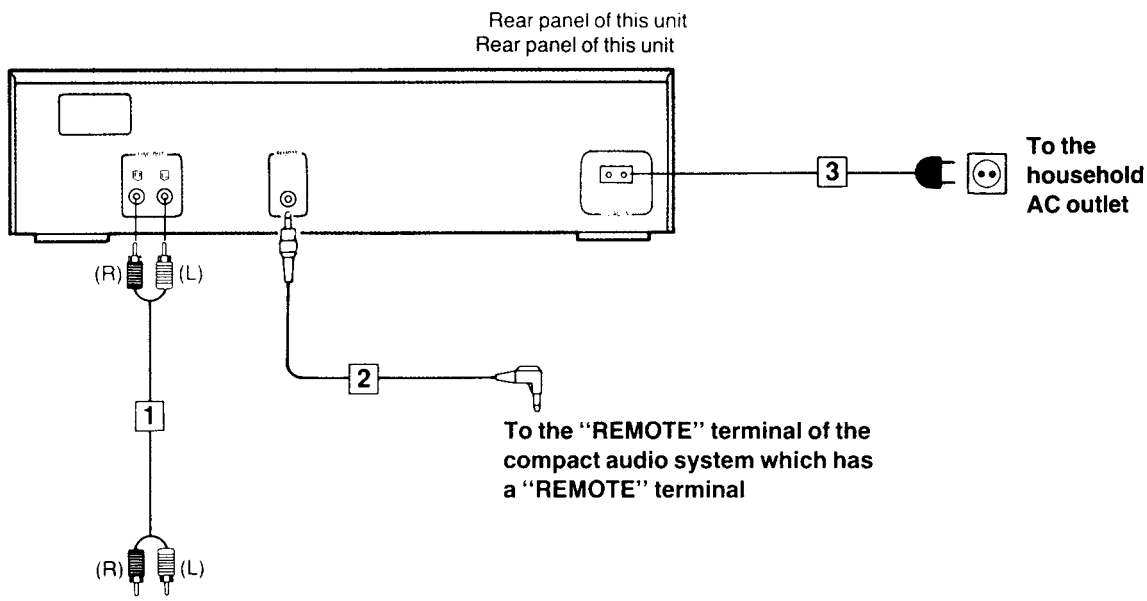
■ **To avoid problems due to vibration.**

- Do not place a book or similar object under this unit.
- Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

■ CONNECTIONS

Notes:

- Turn power off on all components before making connections.
- See the operating instructions of the compact audio system for details.



1 **Stereo connection cable** (included)

2 **L-type cable** (included)

3 **AC power supply cord** (included)

■ ACCESSORIES

- AC power supply cord (polarized) 1
  [SFDAC05E03 (E) / SJA173 (GN) / RJA0004 (GC)]
- Stereo connection cable 1 (SJP2249-3)
- L-type cable 1 (SJP2257T)
- AC plug adaptor ..... 1 (SJP9215 (GC))
- Cabinet extender 2 (RMA0066)
- Screws ..... 4 (XTB3+8JFZ)

■PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780nm
Maximum output radiation power from pick up: 100μW/VDE

Laser radiation from the pick up lens is safety level, but be sure the followings:

1. Do not disassemble the optical pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

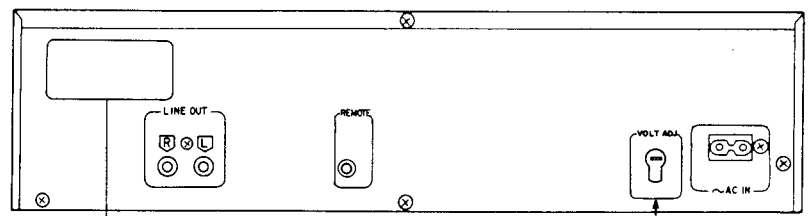
ACHTUNG: Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale strahlungsleistung der lasereinheit: 100μW/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

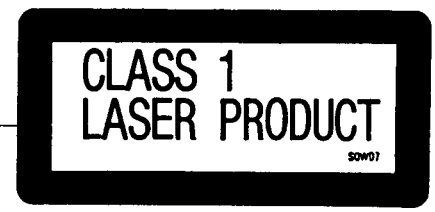
1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.

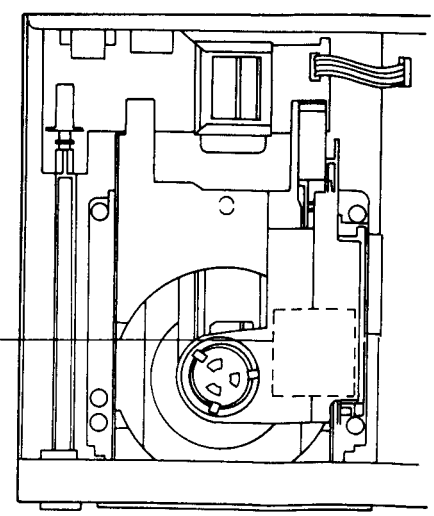


For [GC] area.

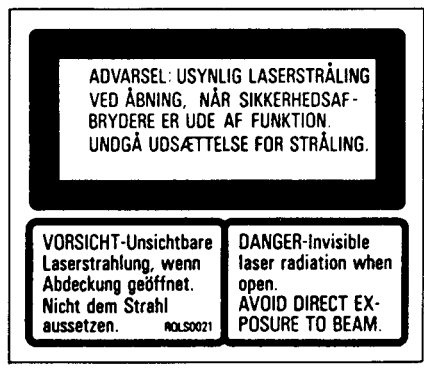
SQWD7



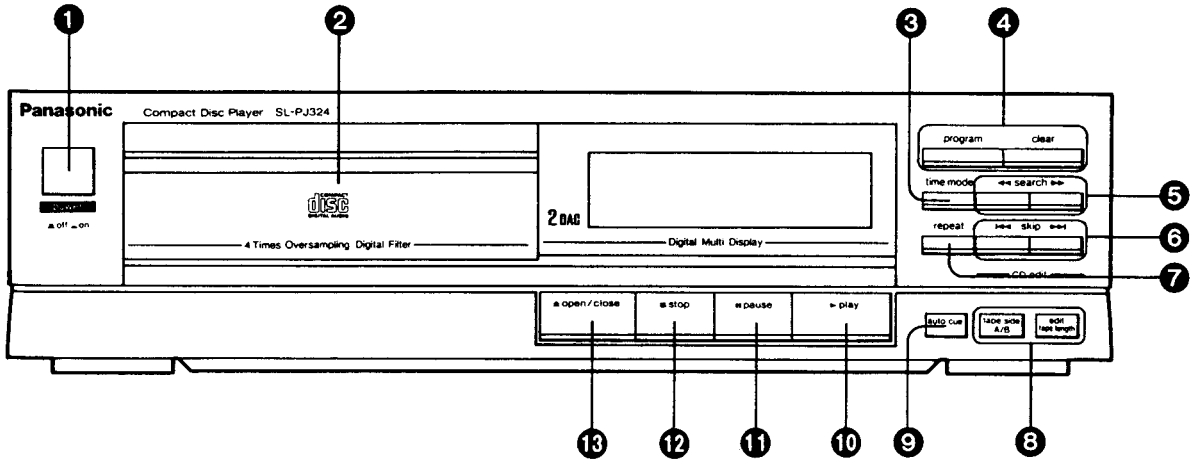
Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.



RQLS0021



■ LOCATION OF CONTROLS



Control section

1 Power switch (power ▙ off ▁ on)

2 Disc holder

3 Time mode select button (time mode)
Use this button to select the desired time display mode.

4 Buttons for program function

- **Programmed-play button (program)**
  Pressing this button initiates the programmed play mode. You can then enter specific tracks using the skip buttons.
- **Clear button (clear)**
  Each pressing this button makes one track cleared from the programmed sequence.

5 Search buttons (◀◀ search ▶▶)
These buttons can be used to move rapidly forward or backward on the disc during play. The search speed is slow when the button is pressed at first and becomes faster if the button is pressed and held continuously.

6 Skip buttons (I◀◀ skip ▶▶I)
These buttons can be used to specify the number of the desired track and the desired recording time of the tape.

7 Repeat button (repeat)

8 Buttons for CD edit function (CD edit)

- **Edit tape length button (edit tape length)**
  When compact discs are to be recorded to tape, this button can be used to calculate the number of tracks that can be recorded on each side of the tape, depending on the length of the cassette tape used, so that as little tape as possible is wasted.
- **Tape-side select button (tape side A/B)**
  When recording compact discs to tape, this button can be used to check the number of tracks and amount of tape left over for side A or B.

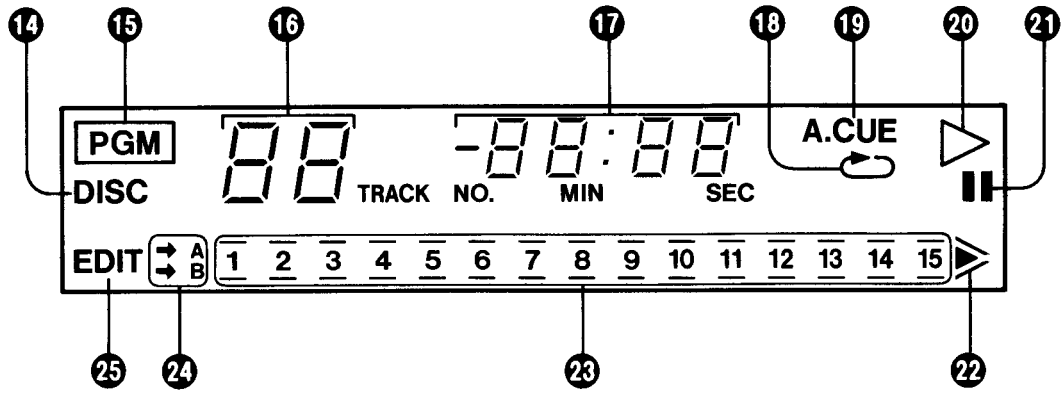
9 Auto cue button (auto cue)
Pressing this button causes the unit to skip automatically to the beginning of the next track on the disc and switch to the play standby mode.

10 Play button (▶ play)

11 Pause button (❚❚ pause)

12 Stop button (■ stop)
This button can be used to stop the disc play, as well as to cancel the various play modes.

13 Disc holder open/close button (▲ open/close)



Indicators section

⑭ **Disk indicator (DISC)**

⑮ **Programmed-play indicator (PGM)**

⑯ **Track number display (TRACK)**

⑰ **Program number/time display (NO./MIN/SEC)**

⑱ **Repeat indicator (↻)**

⑲ **Auto cue indicator (A. CUE)**

⑳ **Play indicator (▷)**

㉑ **Pause indicator (❚❚)**

㉒ **"Over" mark (▶)**
This indicator lights if the total number of tracks on the disc is 16 or more.

㉓ **Track number indicator (1 -15)**

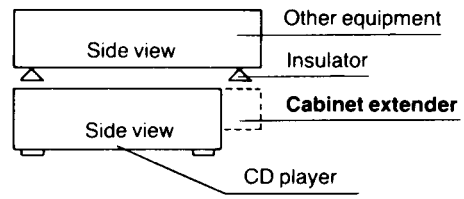
㉔ **Tape side indicator (A/B)**

㉕ **Compact disc edit indicator (EDIT)**

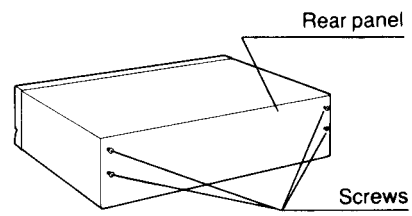
If this unit is connected with Panasonic compact audio system whose remote control transmitter has ▶/❚❚ button for compact disc operation, the pause function may not be activated by pressing the ▶/❚❚ button during compact disc play.

To use the cabinet extenders

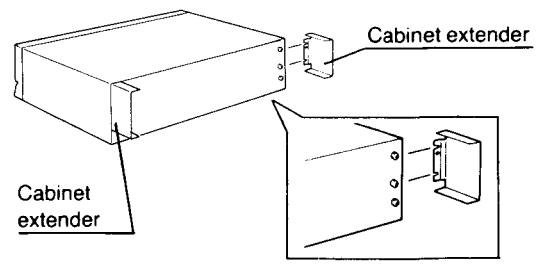
If other audio equipment placed on this unit is too large (i.e., the back insulators do not rest on this unit), affix the cabinet extenders to the rear panel.



1. Insert the four screws (included) and tighten them lightly.

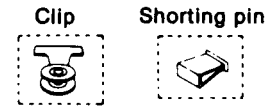


2. Secure the cabinet extenders using the four screws.

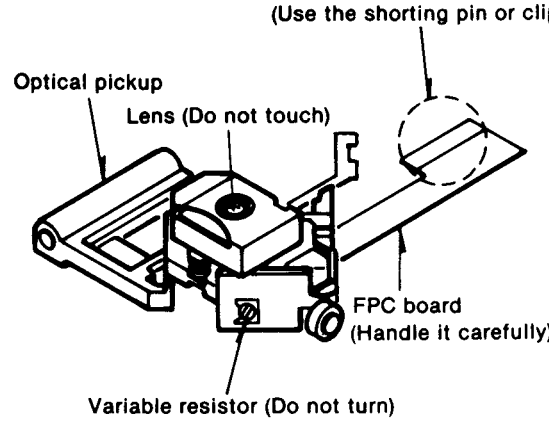


■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.



Be sure to short this position
(Use the shorting pin or clip.)

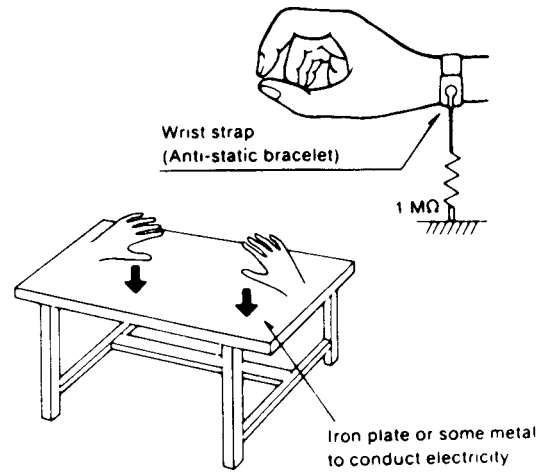


• Handling of optical pickup

1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. (FPC board)
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. (FPC board)
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

• Grounding for electrostatic breakdown prevention

1 Human body grounding
Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.



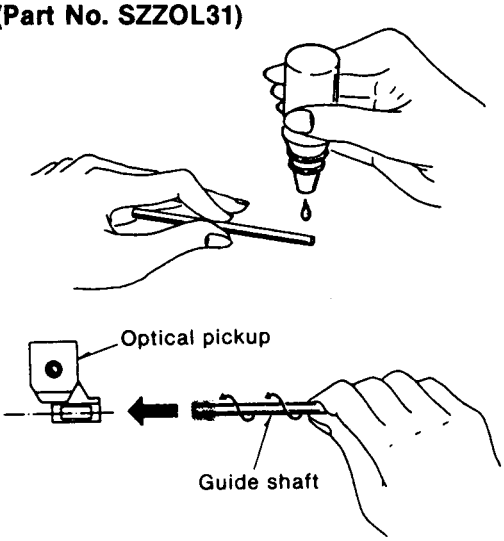
Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZOL31)

The container contains 6g (approx. 3ml) of oil.
One application (one shaft) uses 0.05ml of oil.

How to Use

(1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
(2) Apply one drop of the SZZOL31 to the tip of the guide shaft.
(3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
(4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.



"ATTENTION SERVICER"
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

■ DISASSEMBLY INSTRUCTIONS

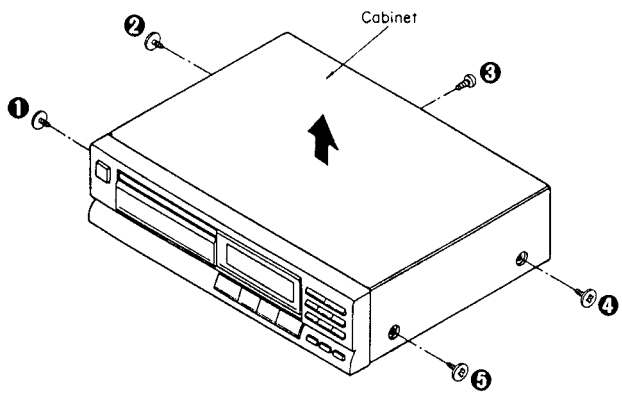
Warning: This product uses a laser diode. Refer to caution statements on page 3.

ACHTUNG:
- Die lasereinheit nicht zerlegen.
- Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

∗This CD player is equipped with FPC boards, so handle them with care during disassembly and reassembly.

Ref. No. 1	Removal of the cabinet

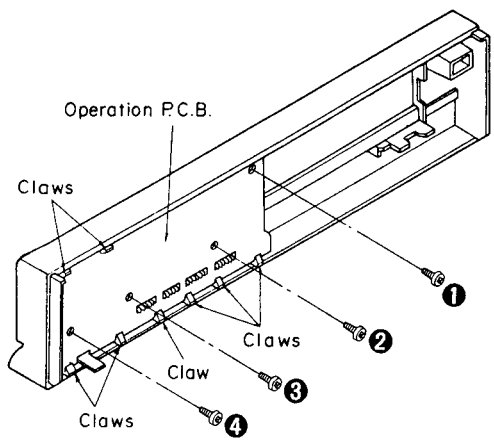
Procedure 1



- Remove the 5 screws (❶~❺).

Ref. No. 3	Removal of the operation P.C.B.

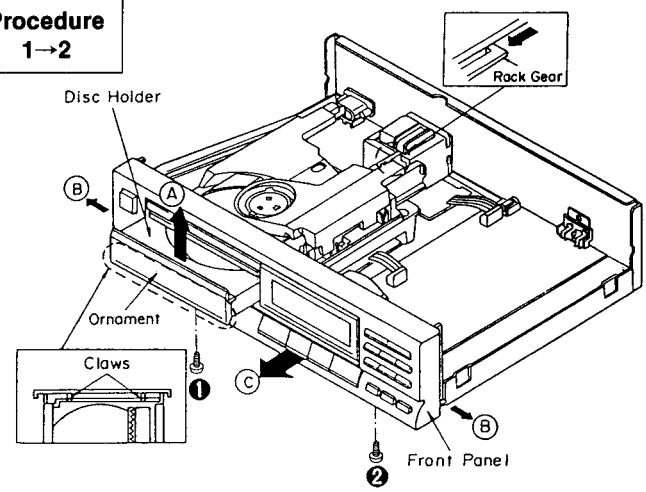
Procedure 1→2→3



1. Remove the 4 screws (❶~❹).
2. Release the 8 claws.

Ref. No. 2	Removal of the ornament of disc holder and the front panel

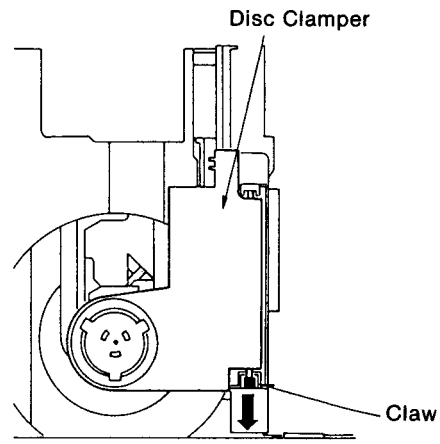
Procedure 1→2



- **Removal of the ornament of disc holder:**
  1. Push the rack gear slowly in the direction of the arrow.
  2. Release the 2 claws and ornament in the direction of the arrow (Ⓐ).
- **Removal of the front panel:**
  1. Remove the 2 screws (❶, ❷).
  2. Slightly pull out the front panel in the direction of the arrow (Ⓑ).
  3. Remove the front panel in the direction of the arrow (Ⓒ).

Ref. No. 4	Removal of the disc clamper

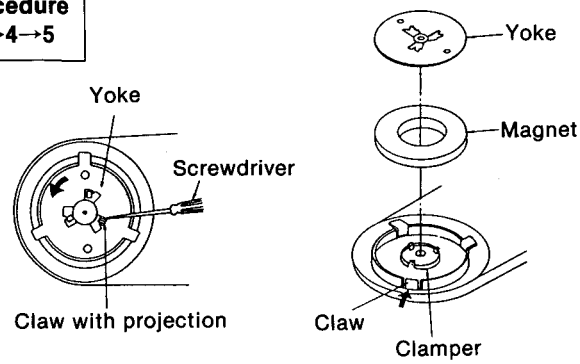
Procedure 1→4



- Push the claw in the direction of the arrow and remove the disc clamper.

Ref. No. 5	Removal of the yoke, magnet and clamper

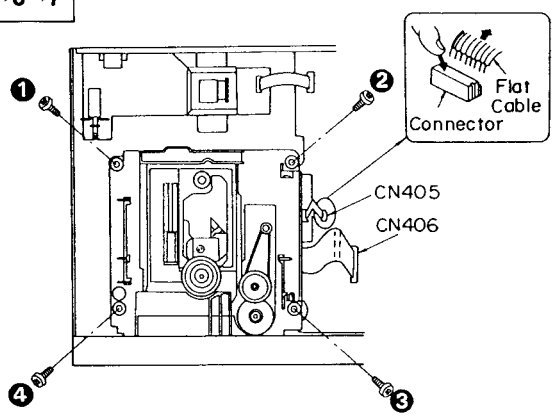
Procedure 1→4→5



1. While lifting the claw with a screwdriver, rotate clamper in the direction of the arrow and remove the yoke and magnet.
2. Release the claw of the clamper.

Ref. No. 7	Removal of the loading unit

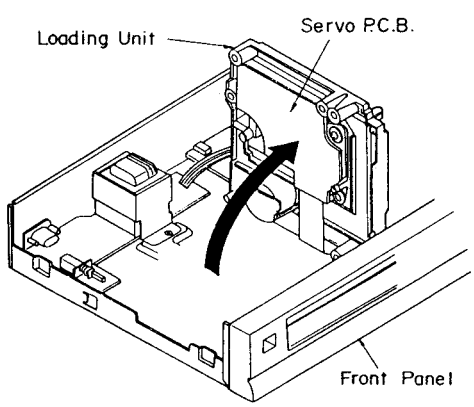
Procedure 1→4→6→7



1. Remove the 4 screws (❶~❹).
2. Remove the 2 flat cables (CN405, CN406).

Ref. No. 8	How to check the servo P.C.B.

Procedure 1→4→6→7→8



- When checking the soldered surface of the servo P.C.B. and replacing the parts, do as shown.
- Don't remove the 2 flat cables (CN405, CN406).

Ref. No. 6	Removal of the disc holder and power switch rod

Procedure 1→4→6

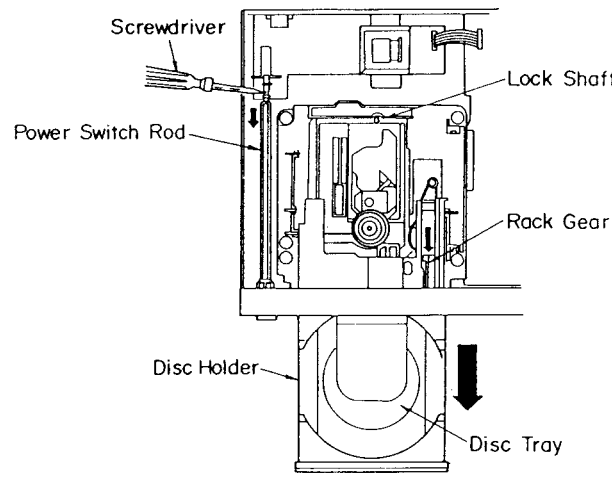
- **Removal of the disc holder:**

1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up.
2. Pull out the disc holder further to remove it.

Note: Pull the lock shaft on the bottom panel to the "FREE" position.

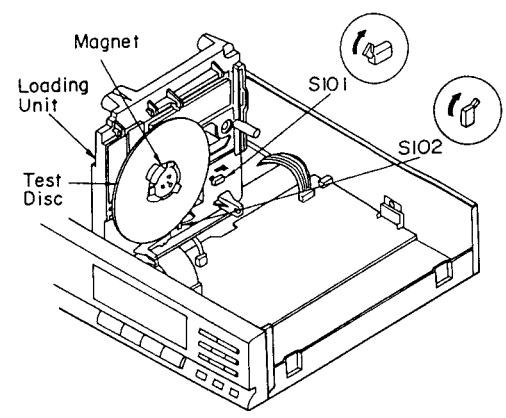
- **Removal of the power switch rod:**

1. Set the power switch to the "OFF" position.
2. Remove the power switch rod by using a screwdriver.

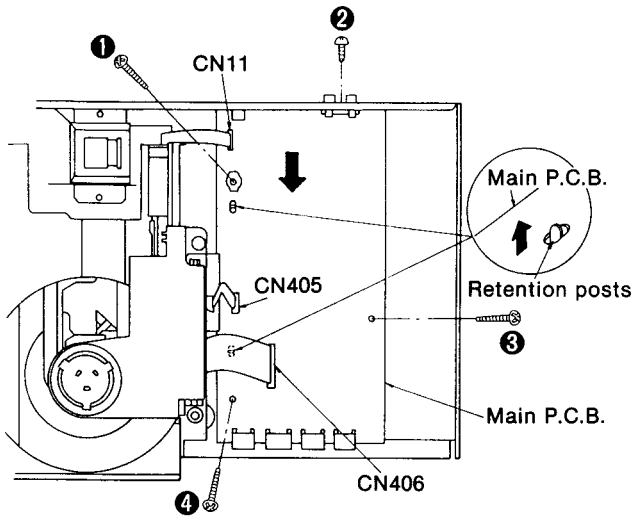


How to play the disc

1. Place the test disc and magnet on the turntable.
2. Switch the player ON.
3. First push the open/close switch (S102) and next, push the S101.
4. After the test disc starts rotating, release the open/close switches (S101, S102).



Ref. No. 9	Removal of the main P.C.B.
Procedure 1→2→3→9	1. Remove the 4 screws (❶~❹). 2. Lift the main P.C.B. off the retention posts on the chassis. 3. Remove the 3 flat cables (CN11, CN405, CN406). 4. Remove the main P.C.B. in the direction of the arrow.

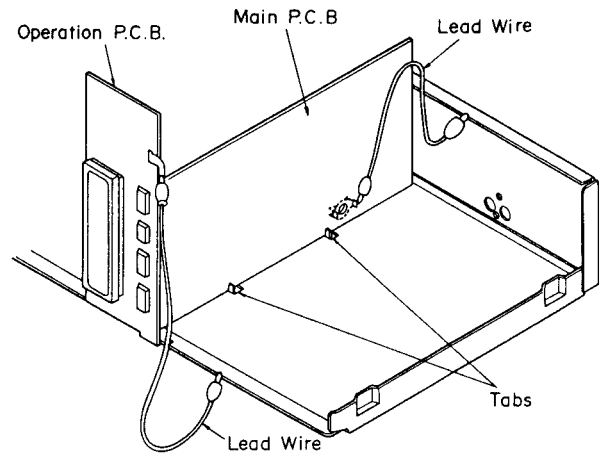


How to check the main P.C.B.

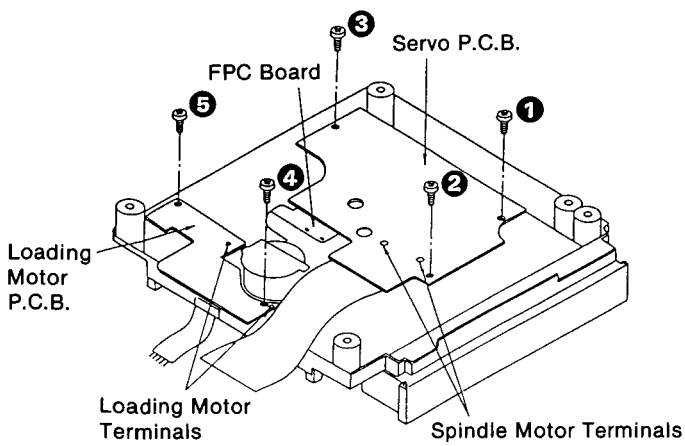
- When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.
- Don't remove the 2 flat cables (CN405, CN406).

Cautions:

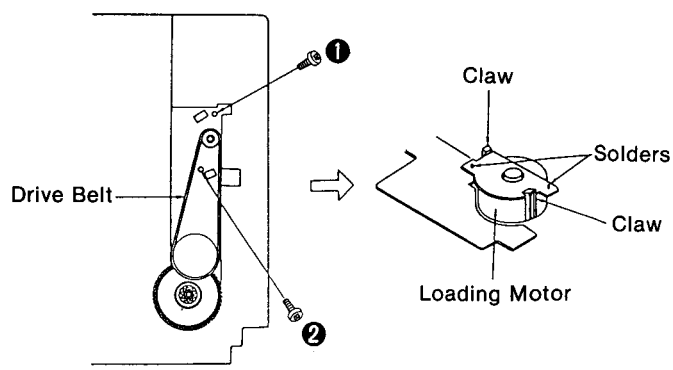
1. Connect the main P.C.B. ground terminal (LINE OUT terminal) to the chassis with a lead wire.
2. Connect the operation P.C.B. ground terminal to the chassis with a lead wire.



Ref. No. 10	Removal of the servo P.C.B. and loading motor P.C.B.
Procedure 1→4→6→7 →10	**• Removal of the servo P.C.B.** 1. Remove the 3 screws (❶~❸). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup. **Caution:** To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board. **• Removal of the loading motor P.C.B.** 1. Remove the 2 screws (❹, ❺). 2. Unsolder the 2 terminals of loading motor.

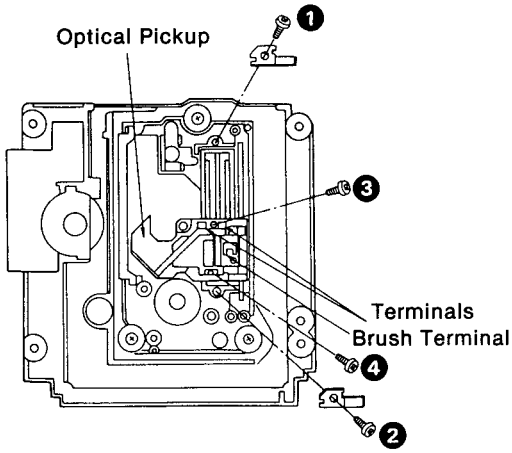


Ref. No. 11	Removal of the loading motor
Procedure 1→4→6→7 →11	1. Remove the drive belt. 2. Remove the 2 screws (❶, ❷). 3. Release the 2 claws. 4. Unsolder the 2 terminals of the lead wire of the loading motor.



Ref. No. 12	Removal of the optical pickup
Procedure 10→12	**Refer to the handling precautions for optical pickup and instructions for traverse oil (See page 6).**

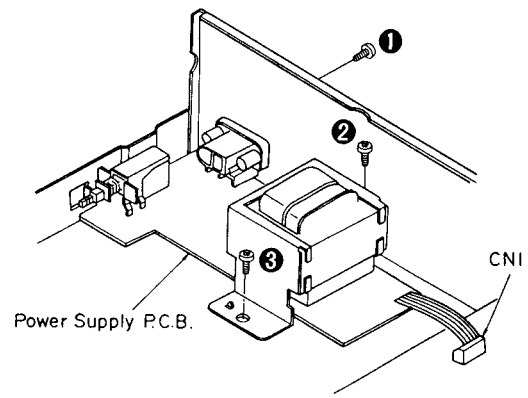
1. Remove the 2 screws (❶, ❷).
2. Unsolder the 2 terminals and the 2 screws (❸, ❹).



Caution: Take care not to touch the brush terminal.

Ref. No. 13	Removal of the power supply P.C.B.
Procedure 1→2→4 →13	

1. Remove the 3 screws (❶~❸).
2. Remove the flat cable (CN11).

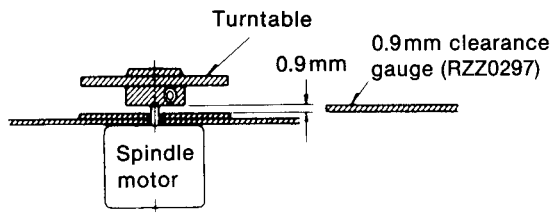


Ref. No. 14	Removal of the spindle motor
Procedure 10→14	

1. Loosen the screw (❶) by using a 1.27mm allen wrench and remove the turntable.
2. Remove the 2 screws (❷, ❸).

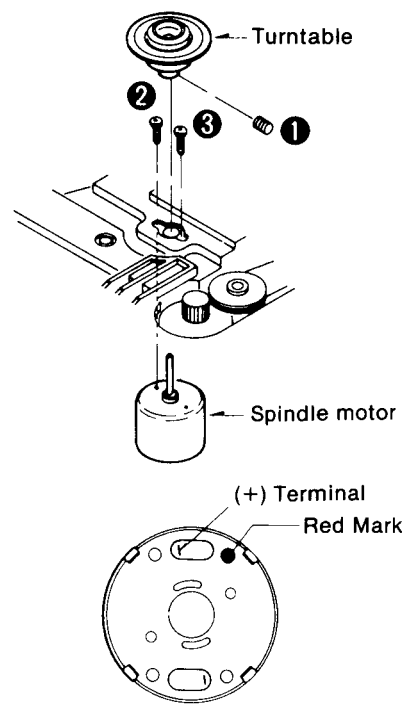
Caution:
1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
2. The (+) terminal of the spindle motor is indicated by the red mark.

Adjustment of turntable height
1. Insert a 0.9mm clearance gauge (RZZ0297) between the turntable and loading base as shown below.



2. Tighten the turntable set-screw by using a 1.27mm allen wrench.

Caution:
Refer to turntable height adjustment (see page 12).



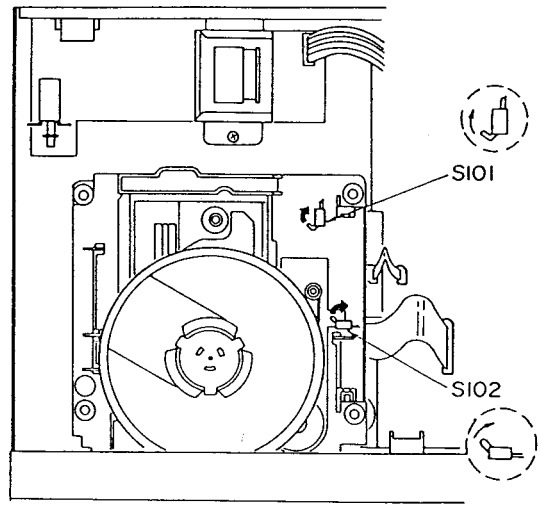
■ MEASUREMENTS AND ADJUSTMENTS

Caution:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens. Avoid exposure to the laser beam, especially when performing adjustments.

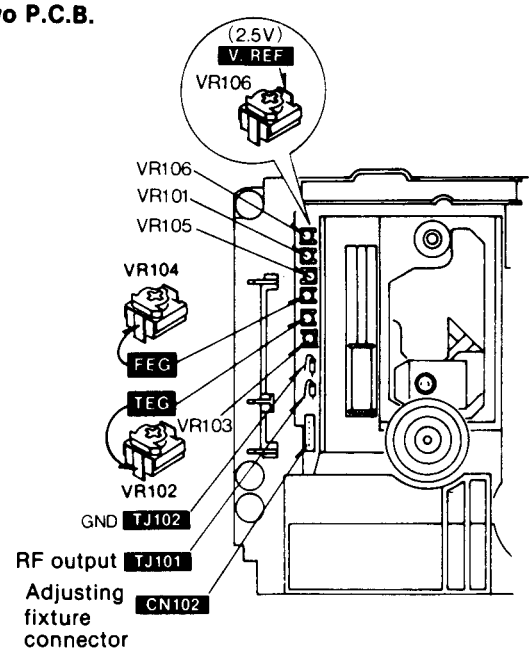
PREPARATION

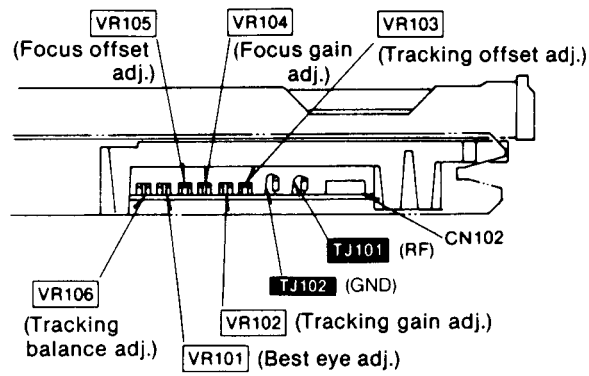
1. Remove the cabinet (see Ref. No. 1 of the disassembly instructions).
2. Remove the disc clamper and magnet (see Ref. No. 4, 5 of the same).
3. Remove the disc holder and power switch rod (see Ref. No. 6 of the same).
4. Place the test disc and magnet on the turntable.
5. Switch the player on.
6. First push the Open/Close switch S102 in the direction of the arrow and then, push switch S101 in the direction of the arrow as shown in the figure.



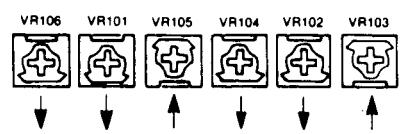
ADJUSTMENT POINTS

• Servo P.C.B.





• Temporary setting of each VR



(Temporary VR setting if any of the trimmer VRs are replaced or require readjustment, temporarily set them to the following positions.)

Measuring Instruments and Special Tools

* Servo gain adjuster (SZZP1017F or SZZP1094C-1)
* Test discs
1. Playability test disc (SZZP1054C or SZZP1014F)
2. Uneven test disc (SZZP1056C)
3. Black band test disc (SZZP1057C)
* Normal disc
* Dual-beam oscilloscope with bandwidth of 30 MHz or better (with EXT trigger and 1 : 1 probe).
* Audio frequency (AF) osillator
* Comversion connector (SZZP1032F)
* Allen wrench (M2.0) (SZZP1101C)
* Allen wrench (M1.27)
* 0.9mm clearance gauge (RZZ0297)
* Filter

Perform adjustments depend on the part to be replaced according to followings:

(1) Spindle motor ..... Items (1), (3) to (8)
(2) Turntable ..... Items (1), (3) to (8)
(3) Optical pickup ..... Items (2) to (8)

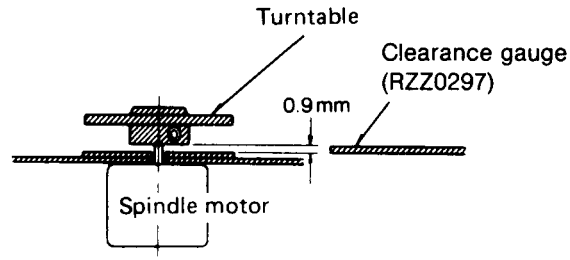
Adjusting Procedure

* If you have replaced the optical pickup, spindle motor, or turntable, do the following adjustment:

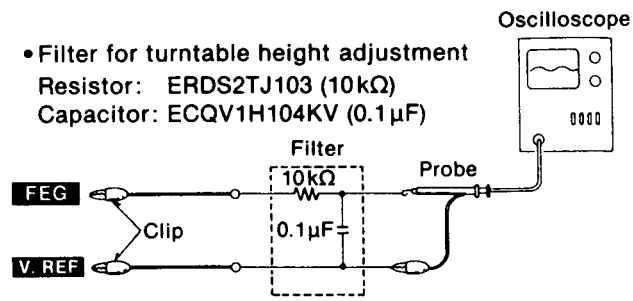
(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9 mm clearance gauge (RZZ0297) between the turntable and the loading base (see the figure at right).
2. Tighten the turntable retention screw with the 1.27 mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across VR104's **FEG** (+) and VR106's **V. REF** (−) **terminals via a filter.**
   (Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)
   Oscilloscope setting: VOLT ..... 50 mV
   SWEEP ..... 1 ms.
   Input coupling ... DC
4. Adjust oscilloscope's DC zero balance.
5. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

Note 1. If the measured amplitude is within a range of +/− 15 mV, the turntable height is correct. If it is outside this range, adjust the turntable height by using the clearance gauge as a pry.
If the amplitude exceeds +15 mV, lower turntable.
If the amplitude is below −15 mV, elevate the turntable.

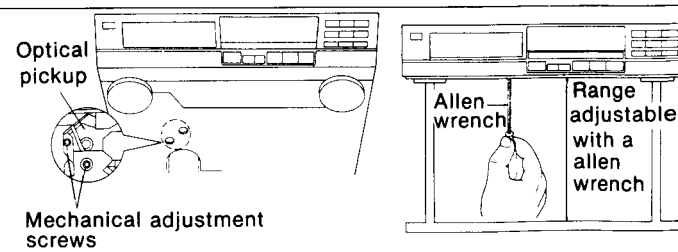


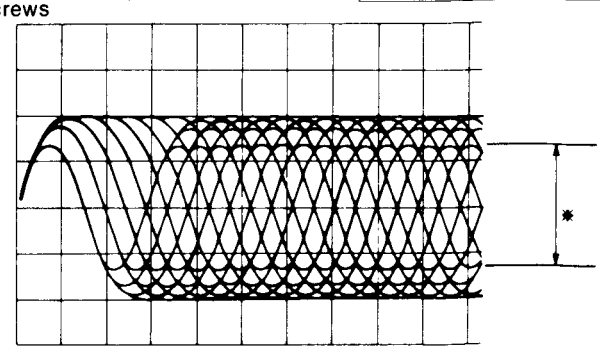
Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set **VR105** at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)



(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (−) on the Servo P.C.B.
   Oscilloscope setting: VOLT ..... 100 mV
   SWEEP ..... 0.5 μs.
   Input coupling ... AC
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1056C). (Playing any other track may yield a false adjustment.)
3. **Leave the player in Play mode, and place it as shown in the figure on the right.**
4. **Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.**
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).

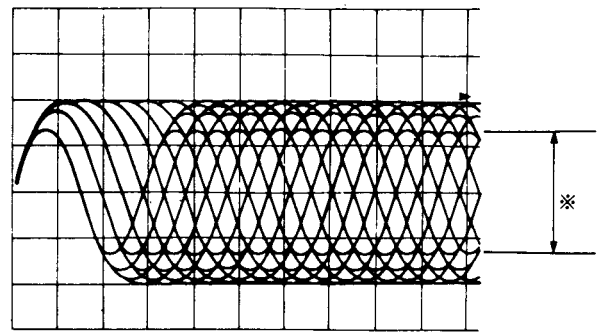




※ Most stretched eye pattern.

(3) BEST EYE (PD BALANCE) ADJUSTMENT

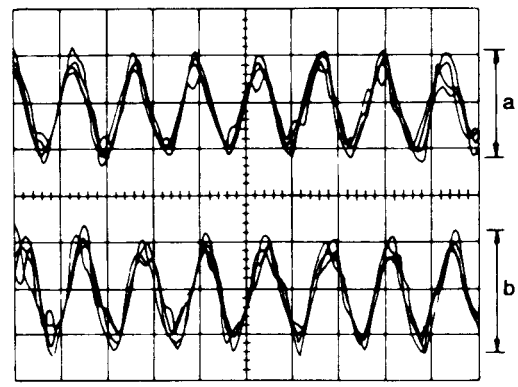
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 100 mV
   SWEEP . . . . . 0.5 μ s
   Input coupling . . . AC
2. **Switch the player power ON, and play the 1kHz (track 1) on the test disc (SZZP1054C).**
3. **Adjust VR101 until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.**



※ Most stretched eye pattern.

(4) FOCUS GAIN ADJUSTMENT

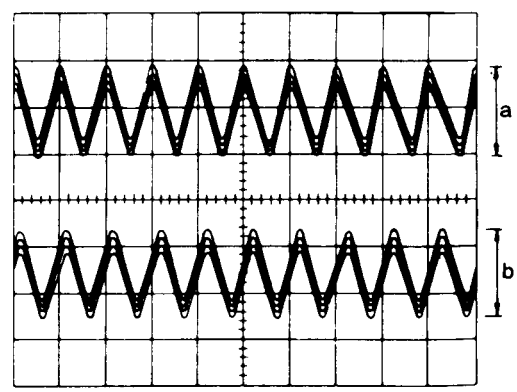
1. Connect the servo gain adjuster to the player (see page 15).
2. Set the servo gain adjuster's gain switch to position "2" and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
   Oscilloscope setting: VOLT . . . . . 100 mV (both channels)
   SWEEP . . . . . 0.2 ms.
   Input coupling . . . AC
5. Play the test disc (SZZP1014F or SZZP1054C).
6. Set the servo gain adjuster's gain switch to position "3", and you will see a 825 Hz signal on the oscilloscope. Adjust **VR104** until the signal amplitudes on both channels become identical to each other.
7. Set the gain switch back to position "2".



※ Adjust **VR104** until a equals b.

(5) TRACKING GAIN ADJUSTMENT

1. Set up the AF oscillator output for **1.1 kHz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
2. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
   Oscilloscope setting: VOLT . . . . . 100 mV (both channels)
   SWEEP . . . . . 0.2 ms.
   Input coupling . . . AC
3. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
4. Set the servo gain adjuster's gain switch to position "1", and you will see a 1.1 kHz signal on the oscilloscope. Adjust **VR102** until the signal amplitudes on both channels become identical to each other.
5. Set the gain switch back to position "2".

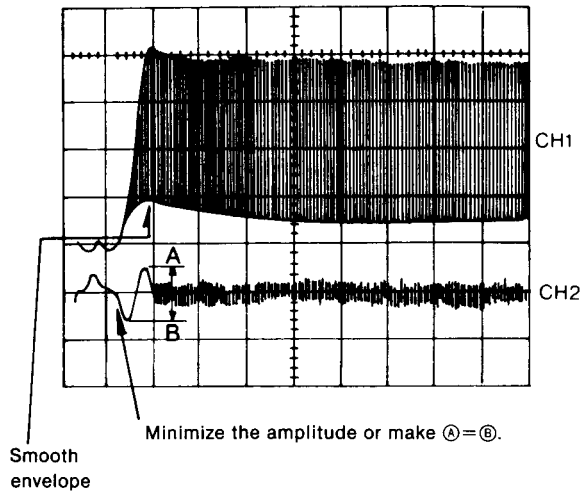


※ Adjust **VR102** until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

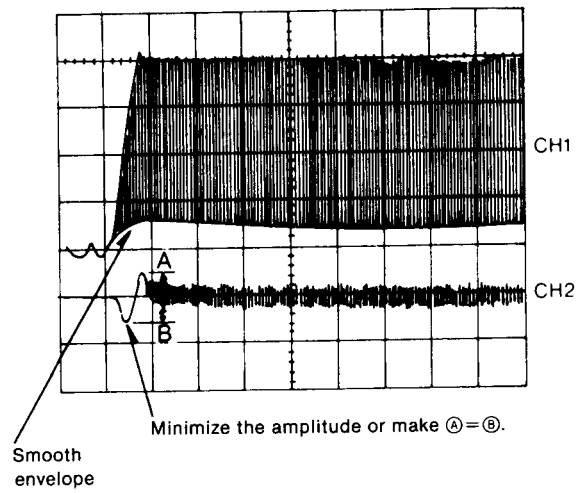
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (−) on the Servo P.C.B. and its CH. 2 probe (+) to VR104's **FEG** terminal.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   100 mV (CH. 2)
   SWEEP. . . . . .0.2 ms.
   Input coupling. . . AC (both CH. 1 and 2)
   Trigger mode . . . .NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR105** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(7) TRACKING OFFSET ADJUSTMENT

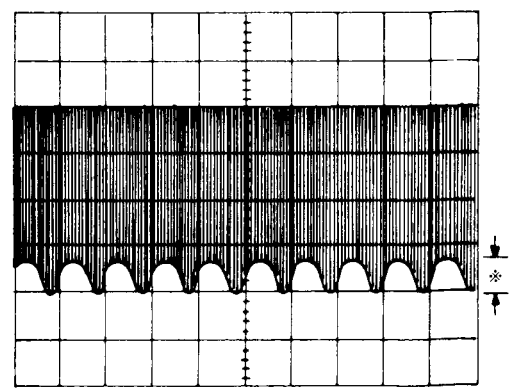
Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (−) on the Servo P.C.B., and its CH. 2 probe (+) to VR102's **TEG** terminal.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   100 mV (CH. 2)
   SWEEP. . . . . .0.2 ms.
   Input coupling. . AC (both CH. 1 and 2)
   Trigger mode. . . NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR103** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(8) TRACKING BALANCE ADJUSTMENT

1. Make sure that the servo gain adjuster's gain switch is set to position "2".
2. Set up the AF oscillator output for **1.1 kHz, 600 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
3. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (−) on the Servo P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   200 mV (CH. 2)
   SWEEP. . . . . .0.1 ms.
   Input coupling. . .AC (both CH. 1 and 2)
   Trigger mode . . .NORM (trigger CH. 2)
4. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
5. Set the servo gain adjuster's gain switch to position "1", and adjust **VR106** so that the wafveform of the output section marked with ※ is balanced.
6. Disconnect the servo gain adjuster's leads from the player.



※ This section of the waveform must be balanced.

(9) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* **Checking Skip Search**

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

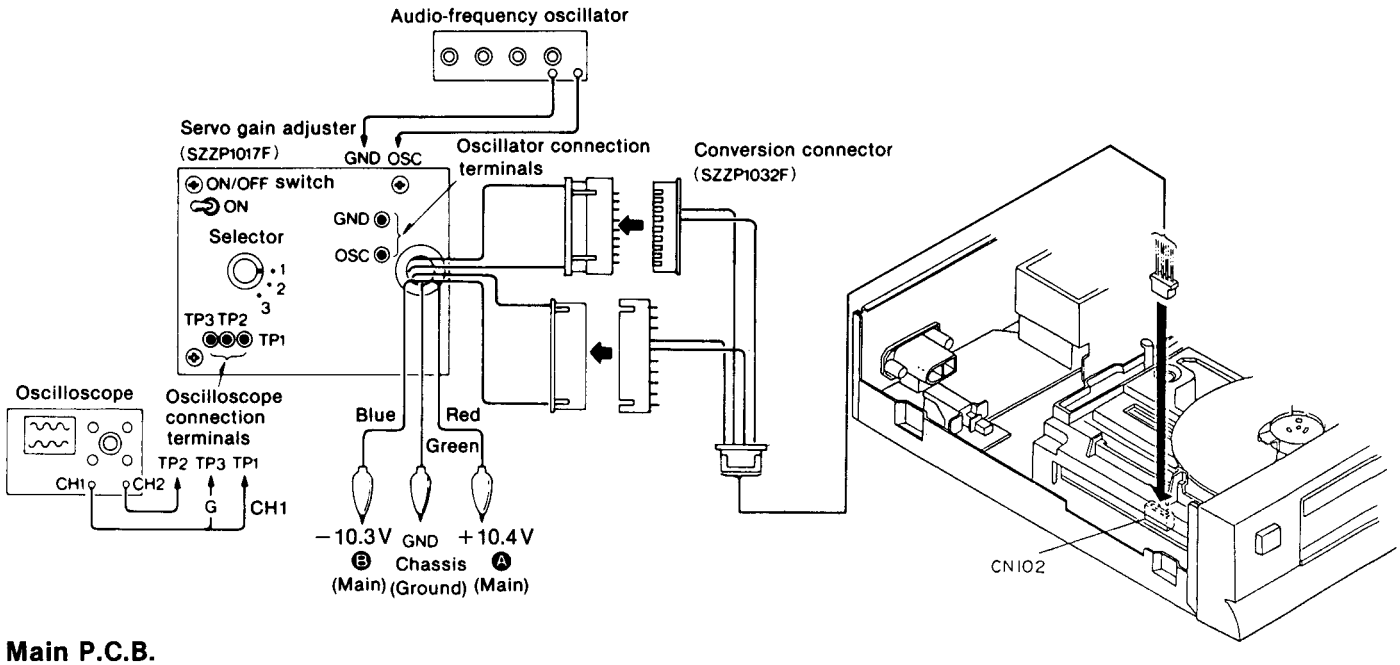
* **Checking Manual Search**

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

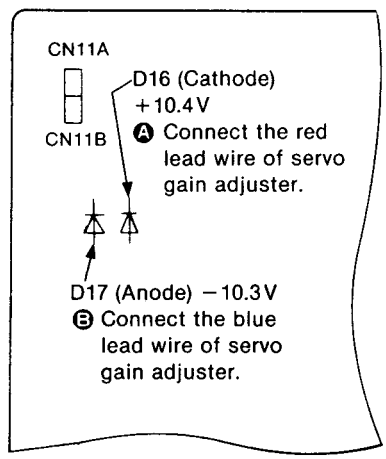
* **Checking Using Defect Disc**

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the defect test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc and verify that no sound skip or noise occurs.

• **Connection of servo gain adjuster**



• **Main P.C.B.**



■ NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)

The following introduces the improved version of the current servo gain adjuster (SZZP1017F):

Part number: SZZP1094C-1

Features:

(1) Contains all oscillation frequencies and output adjustments needed for focus servo gain, tracking servo gain, and tracking balance adjustment (requires no external oscillator).
(2) Panel indicators indicate the best points of focus and tracking servo gains (no oscilloscope needed).
(3) Internal power supply eliminates the need for power supply from the CD player.

■ TERMINAL FUNCTION OF IC'S

• IC101 (AN8373S): Servo amp.

Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (X30 amp.)
2	PDAD	I	Photo detector current input (A2)
3	PDA	I	Photo detector current input (A1)
4	PDBD	I	Photo detector current input (A4)
5	PDB	I	Photo detector current input (A3)
6	LPD	I	Non-inverting laser power input
7	LD	O	Laser power auto control output
8	FBL1	I	PD balance adjustment
9	FBL2	I	
10	TBL1	I	Tracking balance adjustment
11	TBL2	I	
12	FOOFS	I	Focus offset adjustment
13	IVA	O	Current/voltage conversion output (A)
14	IVB	O	Current/voltage conversion output (B)
15	FE	O	Focus gain adjustment output
16	FPI	I	Focus error signal input
17	TPI	I	Tracking error signal input
18	C. TPL	I	Tracking error filter capacitor input
19	C. TPH		
20	C. FPL	I	Focus error filter capacitor input
21	C. FPH		

Pin No.	Mark	I/O Division	Function
22	TPO	O	Tracking error signal output
23	FPO	O	Focus error signal output
24	FGC	I	Focus gain up signal input (Not used, connected to GND)
25	TGC	I	Tracking gain up signal input (Not used, connected to GND)
26	GD	I	Focus/Tracking down signal input (Not used, connected to GND)
27	PTO	O	Position detecting amp. output
28	PTI	I	Position detecting amp. input
29	PBO	O	Position detecting buffer output
30	POT	I	Position detecting buffer input
31	BDO	O	Dropout detection output
32	$\overline{\text{RFDET}}$	O	RF detection signal output
33	SDO	O	Dropout detection pulse output
34	C. SBDO	I	Dropout detecting capacitor input
35	ARF	O	RF signal output
36	C. AGC	I	AGC detecting capacitor input
37	VCC	I	Power supply
38	LDON	I	Laser power control input
39	RF IN	I	RF signal input
40	AMPO	O	RF signal output
41	VREF	O	Reference voltage output
42	GND	—	Ground terminal

• IC402 (MN1550PKH): Remote control signal processor

Pin No.	Mark	I/O Division	Function
1	VDD	I	Power supply
2	OSC	I	Clock input
3	P23	——	(Not used, open)
4	P22	——	(Not used, open)
5	RST	I	Reset signal input
6	P21	——	(Not used, open)
7	P20	I	Remote control signal input

Pin No.	Mark	I/O Division	Function
8	IRQ	I	Program enable/de-enable control
9	P31	O	(Not used, open)
10 ⟆ 13	P10 ⟆ P13	I	Key scan data signal input
14 ⟆ 17	P00 ⟆ P03		
18	VSS	——	GND terminal

• IC102 (AN8374S): Servo processor

Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)
2	LSB	I	Phase difference input (B)
3	TEOFS	O	Tracking offset adjustment
4	TE	O	Tracking gain adjustment
5	TEG	I	
6	TE OUT	O	Tracking error signal output
7	TE BPF	I	Tracking error gain detecting filter (Not used, open)
8	FEG	I	Focus gain adjustment
9	FE OUT	O	Focus error signal output
10	CLW	O	Triangular wave oscillator capacitor output
11	VREF	I	Reference voltage input
12	ARF	I	RF signal input
13	CDSL	I	Data slice filter capacitor input
14	FPC	I	Frequency difference signal input
15	GND	—	Ground terminal
16	C. PLL	I	PLL loop filter constant
17	VSS	—	Ground terminal
18	CLK	I	Frequency pull-in clock signal (88.2 kHz) input
19	SRF	O	Sliced and digitized RF signal output
20	PCK	O	Clock output extracted from SRF
21	EFM	O	EFM signal output synchronous with PCK

Pin No.	Mark	I/O Division	Function
22	VDD	I	Power supply
23	SPCNT	O	Track crossing speed control output output (Not used, open)
24	SENSE	O	Selector output (track crossing state)
25	TRV	O	Traverse servo control output
26	$\overline{\text{FLOCK}}$	O	Focus lock signal output
27	KICK	O	Track kick signal output
28	LDON	O	Laser power control output
29	VDET	O	Focus/tracking gain up output (Not used, open)
30	CNT1	I	Control input (FOON: Focus Servo On signal)
31	CNT2	I	Control input (TRON: Tracking Servo On signal)
32	CNT3	I	Control input (KICKF: Kick Direction (Forward) command)
33	CNT4	I	Control input (KICKR: KICK Direction (Backward) command)
34	TRVF	I	Traverse forward command signal
35	TRVR	I	Traverse backward command signal
36	$\overline{\text{RFDET}}$	I	RF detection signal input
37	BDO	I	Dropout detection input
38	VCC	I	Power supply
39	TVPO	O	Traverse position detecting resistor/capacitor inputs
40	TVPI	I	
41	BROUT	O	Tracking drive control output
42	BRIN	I	Tracking error signal input

• IC103 (AN3877N): BTL drive

Pin No.	Mark	I/O Division	Function
1	PVCC	I	Drive power supply
2	VCC	I	Power supply
3	TB	O	External transistor base driving output
4	VMON	O	Voltage output
5	TVDI	I	Traverse error signal input
6	FDI	I	Focus error signal input
7	TDI	I	Tracking error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	TD−	O	Inverting output of tracking driver
10	TD+	O	Non-inverting output of tracking driver
11	FD−	O	Inverting output of focus driver
12	FD+	O	Non-inverting output of focus driver
13	TVD−	O	Inverting output of traverse driver
14	TVD+	O	Non-inverting output of traverse driver
15	$\overline{\text{RESET}}$	O	Reset signal output
16	PC	I	PC input (connect to GND.)

• IC301 (MN6625): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	BYTCK	O	Serial data byte clock (Not used, open)
2	FCLK	O	Crystal frame clock (7.35kHz) (Not used, open)
3	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
4	SRDATA	O	Serial data output (MSB first)
5	SCK	O	Serial bit clock output
6	LRCK	O	LR discrimination signal output
7	WDCK	O	Serial data output word clock
8	LDG	O	L channel deglitch signal (Not used, open)
9	RDG	O	R channel deglitch signal (Not used, open)
10	IPFLAG	O	Interpolation flag (interpolation at "H")
11	FLAG	O	Error flag terminal
12	XCK	O	Clock (16.9344MHz) output (Not used, open)
13	TEST	I	Test mode selection (Not used, connected to power supply.)
14	TX	O	Digital signal output (Not used, open)
15	SLEEP	I	Mode selector ("L": normal, "H": SLEEP mode) (Not used, connected to GND)
16	CSEL	I	Test terminal ("L": normal) (Not used, connected to GND)
17	X1	I	Clock input (16.9344MHz)
18	X2	O	Clock output (16.9344MHz) (Not used, open)
19	VSS	—	GND terminal
20	BLKCK	O	Sub-code block (Q data) clock (75Hz)
21	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35kHz)
22	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
23	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
24	MLD	I	Command load signal input
25	MCLK	I	Command clock signal input
26	MDATA	I	Command data input
27	DMUTE	I	Muting control
28	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
29	STAT	O	Processing condition (CRC, CUE, CLVS, TT STOP, FCLV)
30	SUBC	O	Sub-code serial output data (Not used, open)
31	SBCK	I	Clock for sub-code serial output (Not used, open)
32	SMCK	O	Clock output (4.2336MHz)
33	VDD	I	Power supply
34	MEMP	I	Emphasis signal input (Not used, open)
35	FG	I	Spindle motor FG signal input (Not used, open)
36	PC	O	Spindle motor ON signal (ON at "L")
37	EC	O	Spindle motor drive signal
38	RESY	O	Resynchronizing signal (Not used, open)
39	DO	I	Drop-out signal (Drop-out at "H")
40	SRF	I	EFM signal input (DSL)
41	EFM	I	EFM signal input (PLL)
42	PCK	I	PLL extract clock input (4.3218MHz)
43	FPC	O	PLL frequency comparision signal
44 ∫ 51	D7 ∫ D0	I/O	16K RAM data input/output
52	RAM/OE	O	16K RAM $\overline{\text{OE}}$ signal
53	RAM/WE	O	16K RAM $\overline{\text{WE}}$ signal
54 ∫ 64	RAM/A0 ∫ RAM/A10	O	16K RAM address signal (RAMA0: LSB, RAMA10: MSB)

• IC401 (MN15283PKG): System control & FL drive

Pin No.	Mark	I/O Division	Function
1	CLOSE SW	I	Disc holder "Close" detection
2	DECK IN	I	Synchro edit control input
3	NC	——	Not connected
4			
5	RST	I	Reset signal input
6	BLKCK	I	Sub-code block (Q data) clock input (75 Hz)
7 ⟆ 10	P50 ⟆ P53	I	Key scan data signal input
11	CLDCK	I	Sub-code block (Q data) clock input (7.35 kHz)
12	SUBQ	I	Sub code (Q data) input
13	CLOSE	O	Loading motor "Close" command
14	OPEN	O	Loading motor "Open" command
15	TRVR	O	Traverse "Reverse" command signal
16	TRVF	O	Traverse "Forward" command signal
17	CNT4	O	Optical servo IC control signal (KIKCR: Kick direction [Reverse] command)
18	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
19	CNT2	O	Optical servo IC control signal ($\overline{\text{TRON}}$: Tracking servo)
20	CNT1	O	Optical servo IC control signal ($\overline{\text{FOON}}$: Focus servo)
21	STAT	I	Processing status input from signal processor LSI

Pin No.	Mark	I/O Division	Function
22	NC	——	Not connected
23	FLOCK	I	Optical servo condition (focus) input
24	SENSE	I	Optical servo condition (Track cross) input
25	NC	——	Not connected
26	SYNC	O	Synchro edit control output (Not used, open)
27	DAC	O	(Not used, open)
28	VPP	I	FL drive power supply
29 ⟆ 44	D0 ⟆ DF	O	FL glid signal and key scan data signal
45 ⟆ 53	S8 ⟆ S0	O	FL anode signal
54	VDD	I	Power supply
55	OSC2	I	Clock input (4.2336 MHz)
56	OSC1		
57	VSS	——	GND terminal
58	XO	——	Clock terminal (Not used, open)
59	XI	I	Optical servo condition (Track cross) input
60	MUTE	O	Muting control output
61	MDATA	O	Command data output
62	MCLK	O	Command clock output
63	MLD	O	Command load output
64	OPEN SW	I	Disc holder "Open" detection

• IC801 (SM5807ESET): Digital filter

Pin No.	Mark	I/O Division	Function
1	XT	I	Osicllator input
2	$\overline{XT}$	O	Oscillator output (not used, open)
3	$\overline{CKSL}$	I	$\overline{CKSL}$ = H : External input of 16.9344 MHz or 17.2872 MHz to XT $\overline{CKSL}$ = L : External input of 8.4672 MHz or 8.6436 MHz to XT
4	CKO	O	Clock output (not used, open)
5	LRCI	I	44.1 kHz synchronization clock input
6	DIN	I	Serial data input
7	BCKI	I	Serial data bit clock input
8	VSS	I	Digital ground terminal

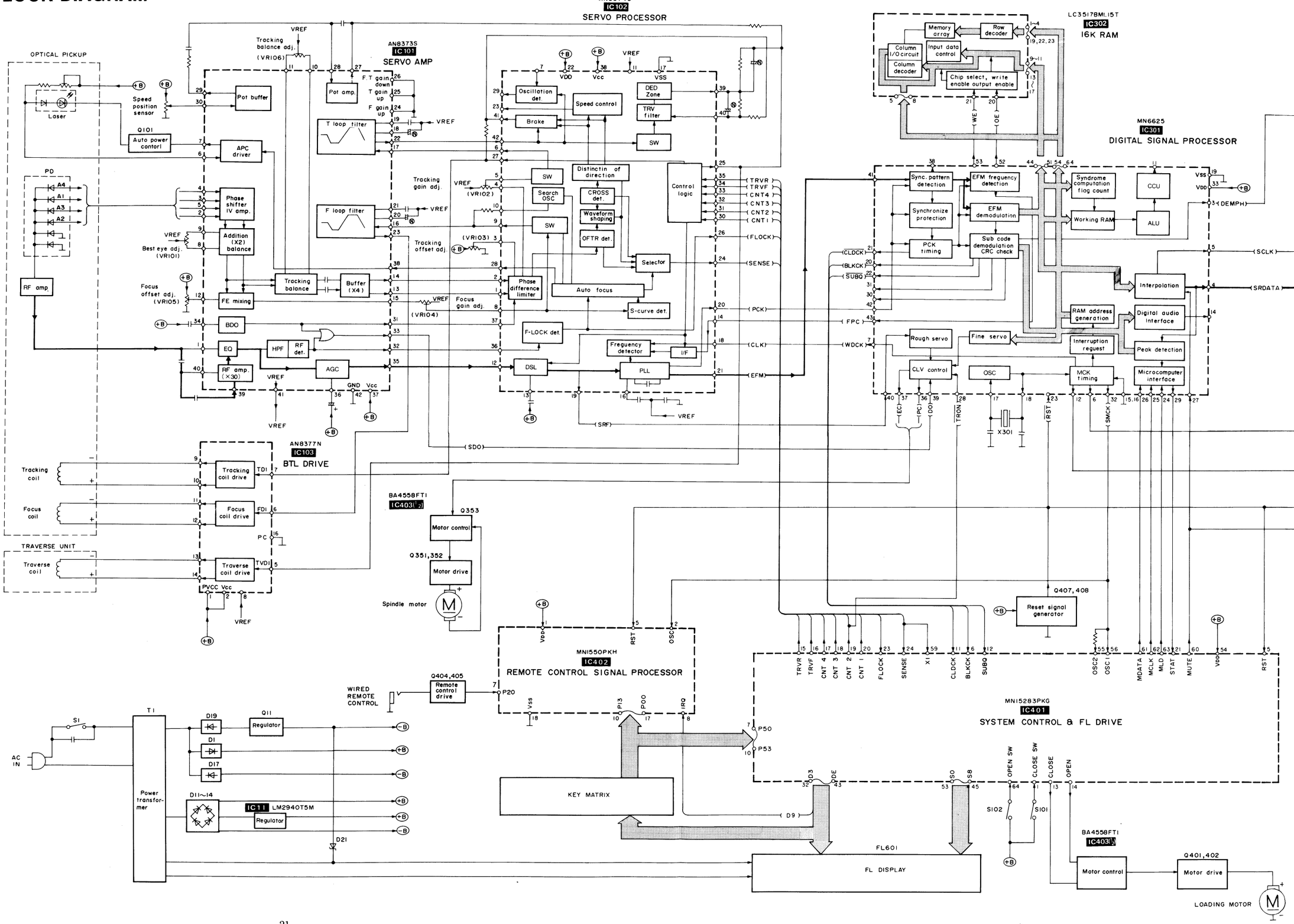
Pin No.	Mark	I/O Division	Function
9	$\overline{SCSL}$	I	$\overline{SCSL}$ = H : System clock = 192 fs $\overline{SCSL}$ = L : System clock = 196 fs (fs = sampling frequency)
10	DGR	O	R ch deglitch signal (176.4 kHz) (not used, open)
11	DGL	O	L ch deglitch signal (176.4 kHz) (not used, open)
12	D OUT	O	Serial data output
13	WDCO	O	Output control clock (352.8 kHz)
14	$\overline{LRCO}$	O	Output control clock (176.4 kHz)
15	BCKO	O	Serial bit clock output (8.4672 MHz or 8.6436 MHz)
16	VDD	I	Power supply terminal (connected to +4.8V)

• IC802 (UPD6376GSE1): D/A Converter

Pin No.	Mark	I/O Division	Function
1	NC	–	Not connected
2	D. GND	I	Ground terminal
3	D. VDD	I	Power supply (connected to +4.8V)
4			
5	A. GND	I	Ground terminal
6	R. OUT	O	R ch signal output
7	A. VDD	I	Power supply (connected to +4.8V)
8			
9	R. REF	O	R ch reference voltage capacitor output

Pin No.	Mark	I/O Division	Function
10	L. REF	O	L ch reference voltage capacitor output
11	L. OUT	O	L ch signal output
12	A. GND	I	Ground terminal
13	LRCK	I	L/R clock signal input
14	LRSEL	I	L/R clock selector (Not used, connected to power supply)
15	SI	I	Serial data signal input
16	SLK	I	Serial bit clock input

■ BLOCK DIAGRAM



AN8374S
IC102
SERVO PROCESSOR

LC3517BML15T
IC302
16K RAM

MN6625
IC301
DIGITAL SIGNAL PROCESSOR

Q851
De-emphasis control

SM5807ESET
IC801
DIGITAL FILTER

UPD6376GSE1
IC802
D/A CONVERTER

LM833M63
IC803

Q853~855
Muting control

Q407,408
Reset signal generator

MN1550PKH
IC402
TE CONTROL SIGNAL PROCESSOR

MN15283PKG
IC401
SYSTEM CONTROL & FL DRIVE

KEY MATRIX

FL601
FL DISPLAY

BA4558FTI
IC403

Q401,402
Motor drive

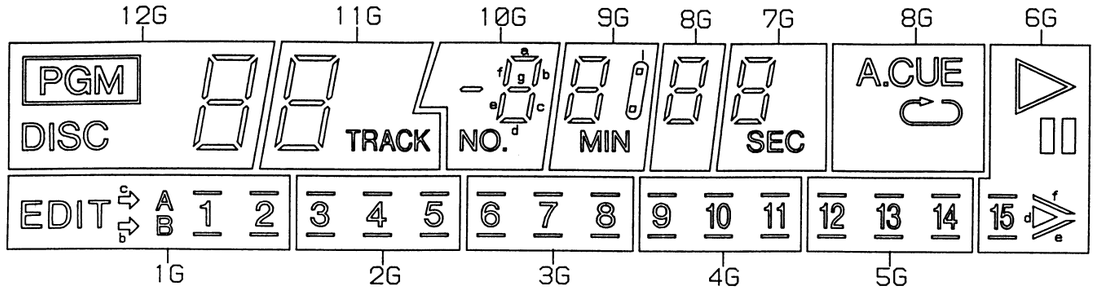
LOADING MOTOR

LINE OUT

Note:
Audio signal

■ INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection table

	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a	15	12	9	6	3	EDIT A/B
b	b	b	b	b	b	b	(15)	(12)	(9)	(6)	(3)	→ (下)
c	c	c	c	c	c	c	(15)	(12)	(9)	(6)	(3)	→ (上)
d	d	d	d	d	d	d		13	10	7	4	1
e	e	e	e	e	e	e		(13)	(10)	(7)	(4)	(1)
f	f	f	f	f	f	f		(13)	(10)	(7)	(4)	(1)
g	g	g	g	g	g	g		14	11	8	5	2
h	PGM	TRACK	—	MIN	↻	SEC		(14)	(11)	(8)	(5)	(2)
i	DISC	-	NO.	■ ■	A.CUE	-	-	(14)	(11)	(8)	(5)	(2)

• Pin connection

PIN NO.	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F 2	F 2	N P	a	N P	N P	b	c	d	e	f	g	h	i	12 G	11 G	N P	N P	N P	N P	10 G	9 G	8 G	7 G	6 G	5 G	4 G	3 G	2 G	N P	N P	N P	1 G	N P	F 1	F 1

Note 1.)NP·····No pin.
2.)F1,F2·····Filament
3.)1G~12G····Grid.

■ SCHEMATIC DIAGRAM

(Parts list on pages 40, 41, 47, 48.)

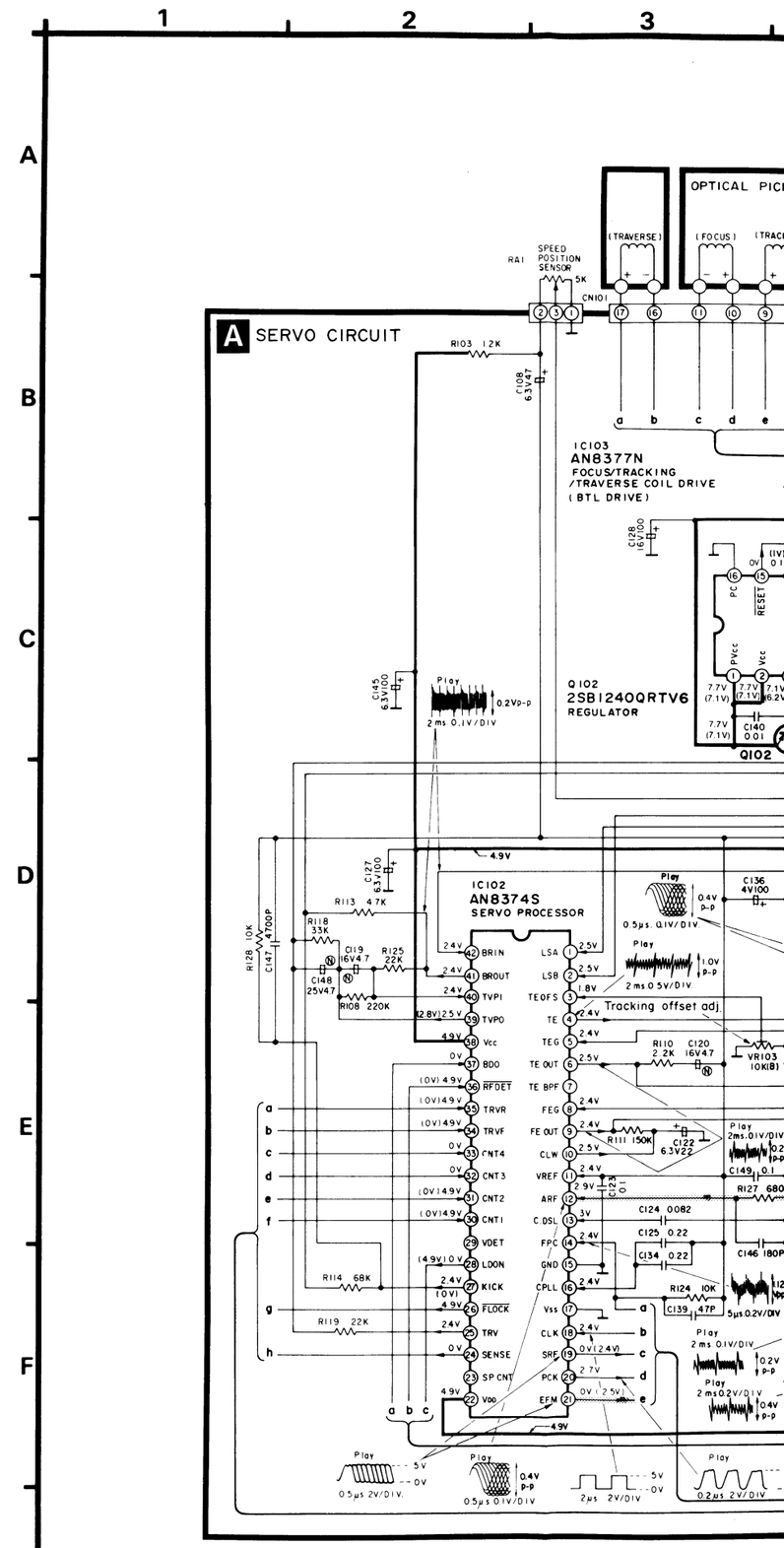
(This schematic diagram may be modified at any time with development of new technology.)

Notes:

- **S1** : Power switch (POWER ▙ OFF ▟ ON) in "**on**" position.
- **S2** : Voltage selector switch. [For (GC) area.]
- **S101, 102** : Disc holder open/close detection switches.
- **S601** : Disc holder open/close (▲ OPEN/CLOSE) switch.
- **S602** : Stop (■ STOP) switch.
- **S603** : Repeat (REPEAT) switch.
- **S604** : Pause (▮▮ PAUSE) switch.
- **S605** : Play (▶ PLAY) switch.
- **S606, 607** : Search (◀◀ SEARCH ▶▶) switches. [S606 : ◀◀ (B), S607 : ▶▶ (F)]
- **S608, 609** : Skip (I◀◀ SKIP ▶▶I) switches. [S608 : I◀◀ (B), S609 : ▶▶I (F)]
- **S610** : Time mode select (TIME MODE) switch.
- **S611** : Program (PROGRAM) switch.
- **S612** : Clear (CLEAR) switch.
- **S613** : Auto cue (AUTO CUE) switch.
- **S614** : Tape side select (TAPE SIDE A/B) switch.
- **S615** : Edit tape length (EDIT TAPE LENGTH) switch.

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- ——— / - - - - - : Positive voltage lines and negative voltage lines.
- ▒▒▒ : audio signal lines.

Caution!
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.



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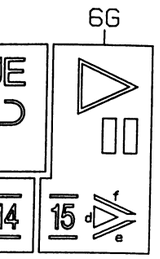
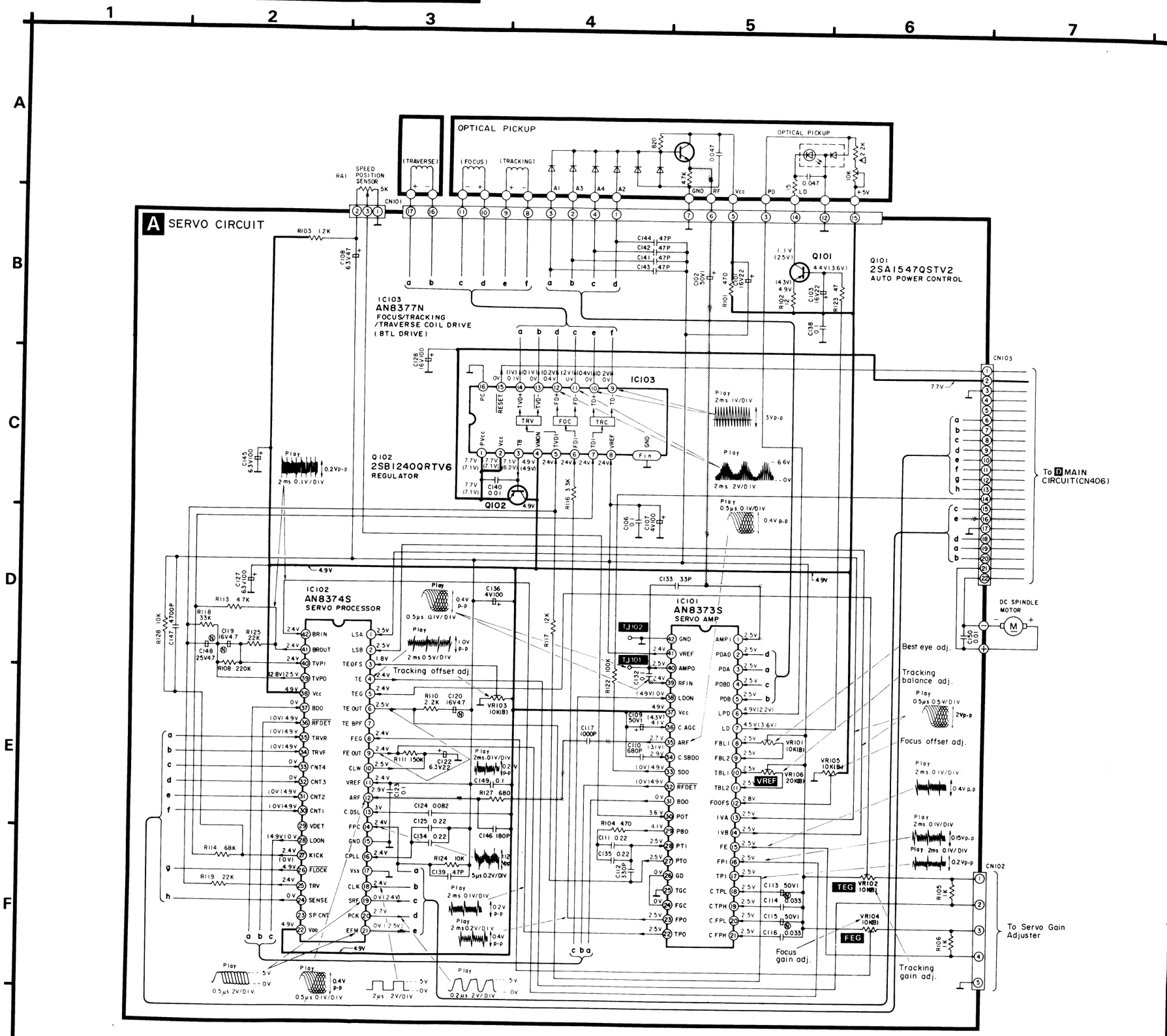
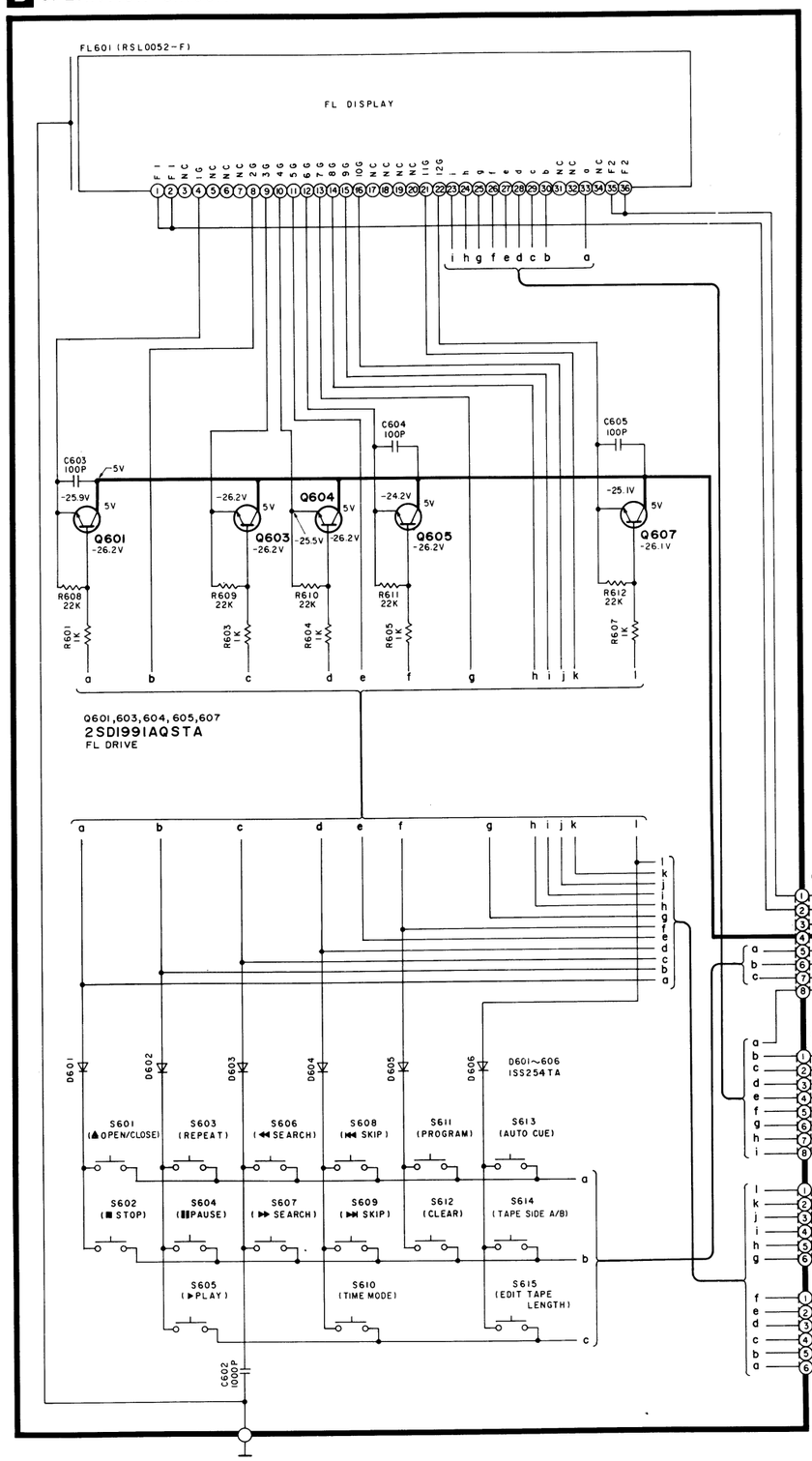


2G	1G
3	EDIT A/B
(3)	→ (下)
(3)	→ (上)
4	1
(4)	(1)
(4)	(1)
5	2
(5)	(2)
(5)	(2)

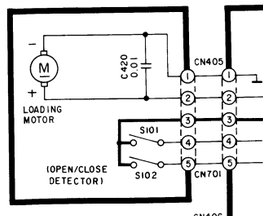
6	5	4	3	2	1
N	N	1	N	F	F
P	P	G	P	1	1



B OPERATION CIRCUIT



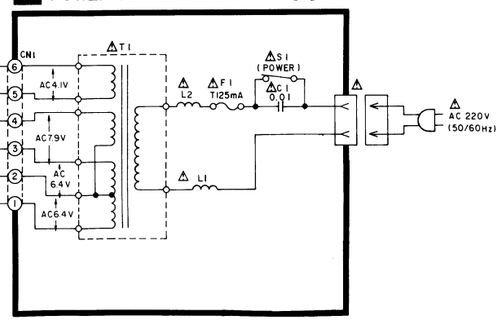
C MOTOR/ SWITCH CIRCUIT



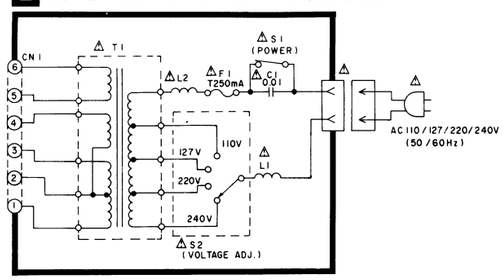
D MAIN CIRCUIT

17 18 19 20 21 22 23 24 25 26

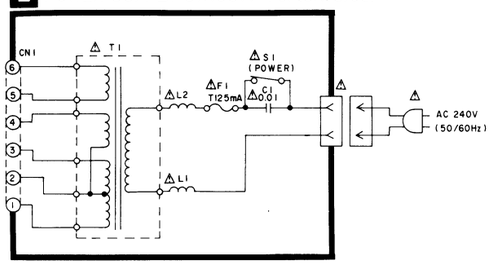
E POWER SUPPLY CIRCUIT For [E] area.



E POWER SUPPLY CIRCUIT For [GC] area.

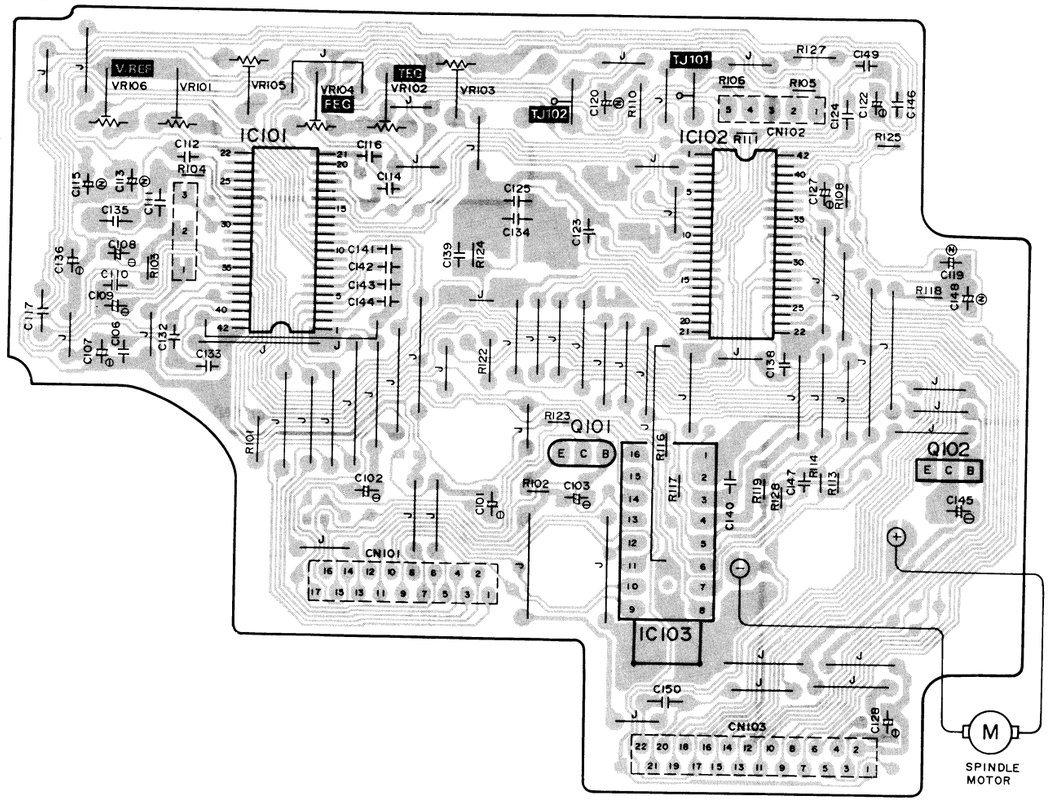


E POWER SUPPLY CIRCUIT For [GN] area.

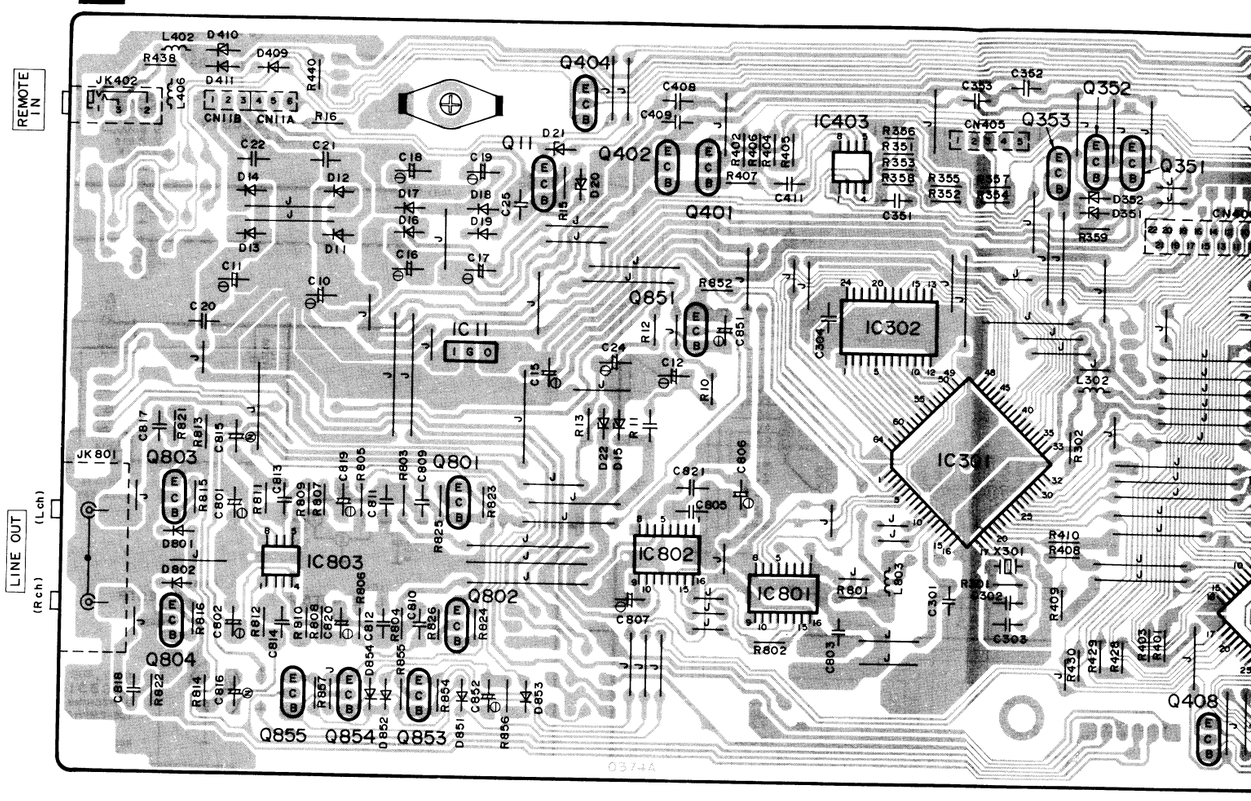


■ PRINTED CIRCUIT BOARDS

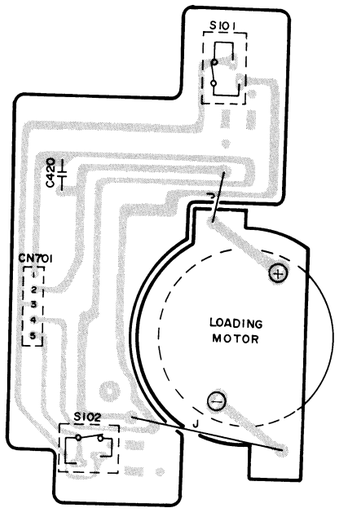
A SERVO P.C.B.



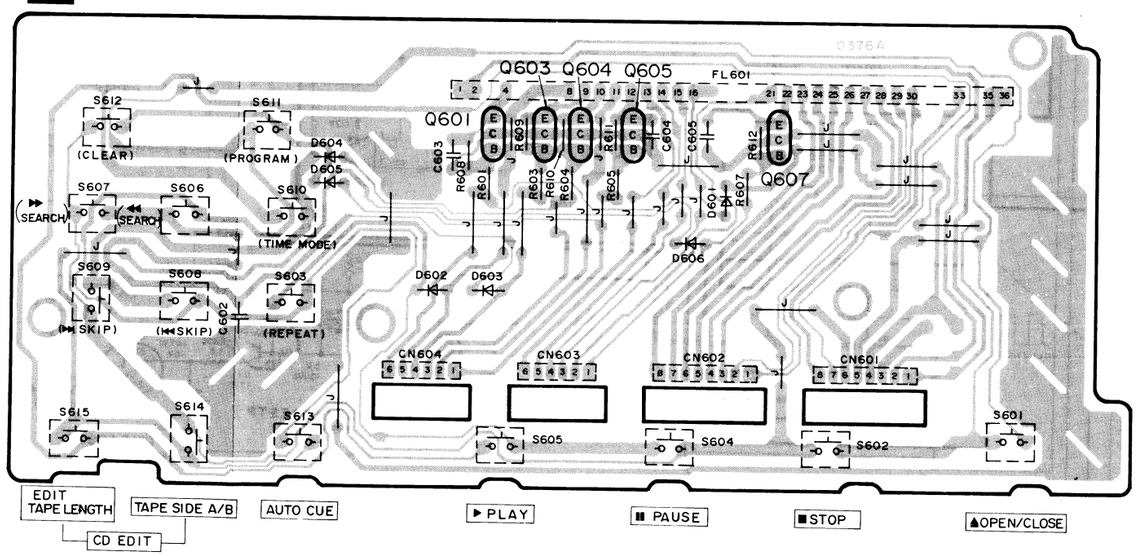
D MAIN P.C.B.



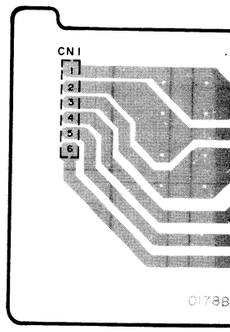
C MOTOR/SWITCH P.C.B.



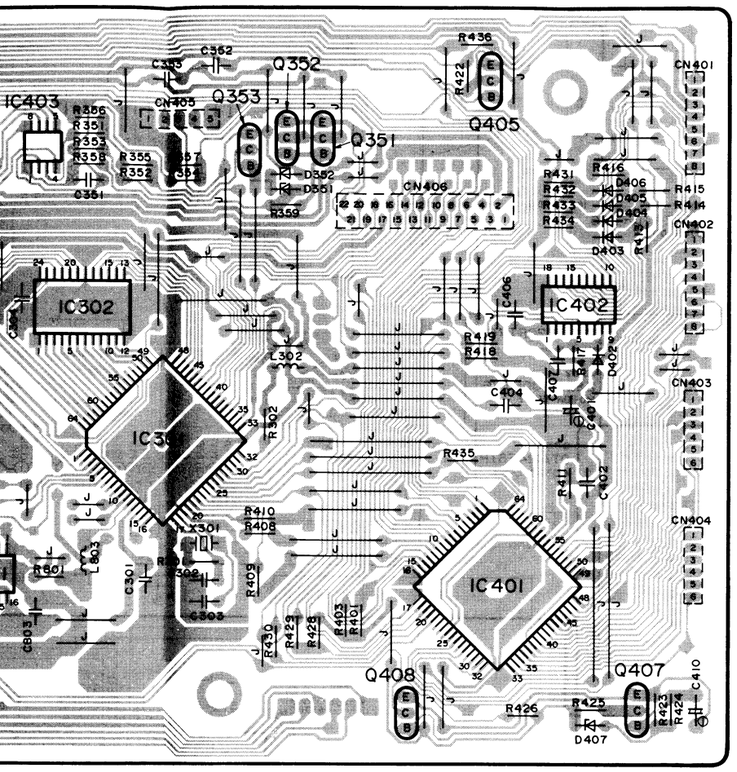
B OPERATION P.C.B.



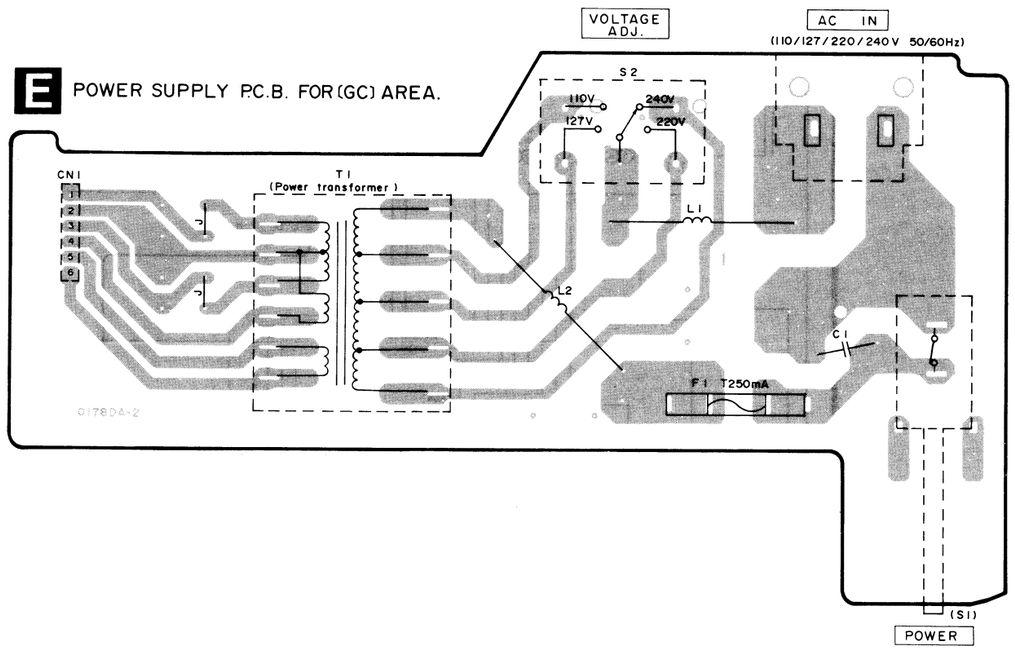
E POWER SUPPLY



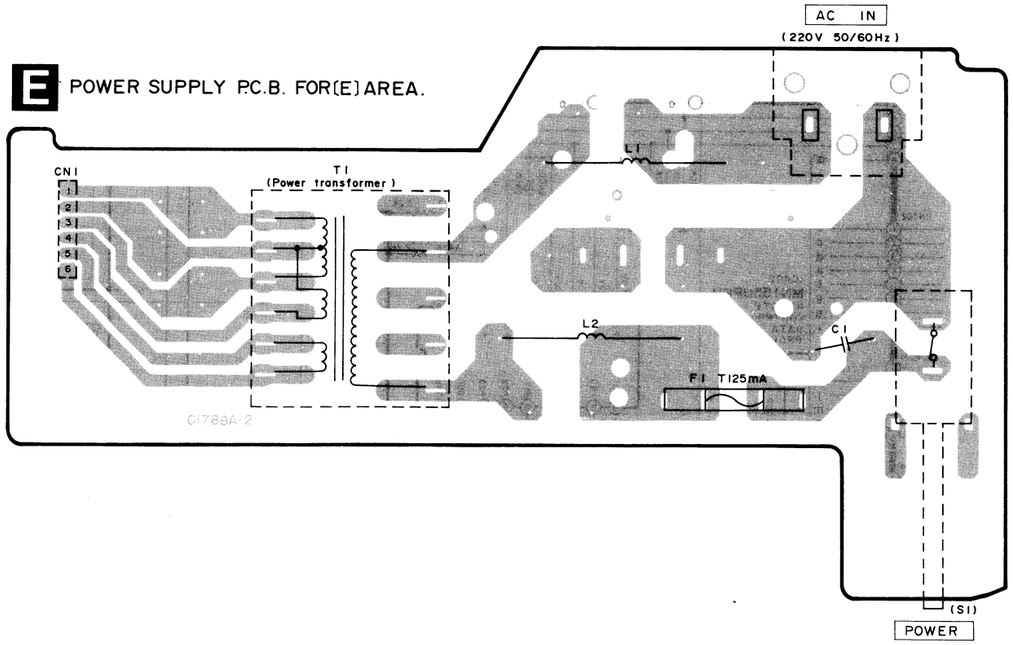
9 10 11 12 13 14 15 16 17 18 19



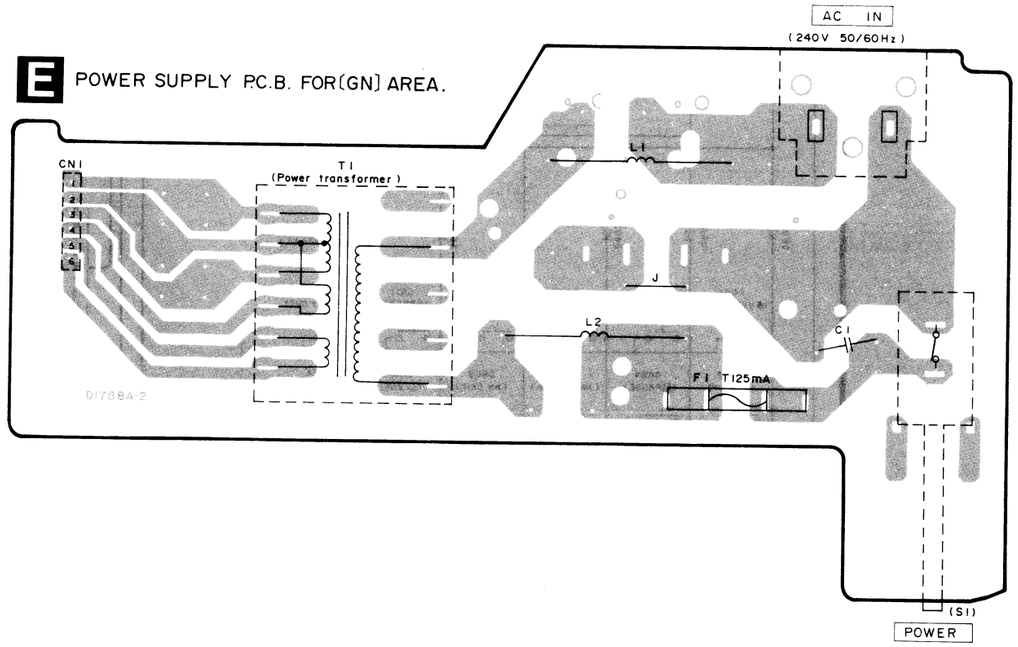
E POWER SUPPLY P.C.B. FOR (GC) AREA.



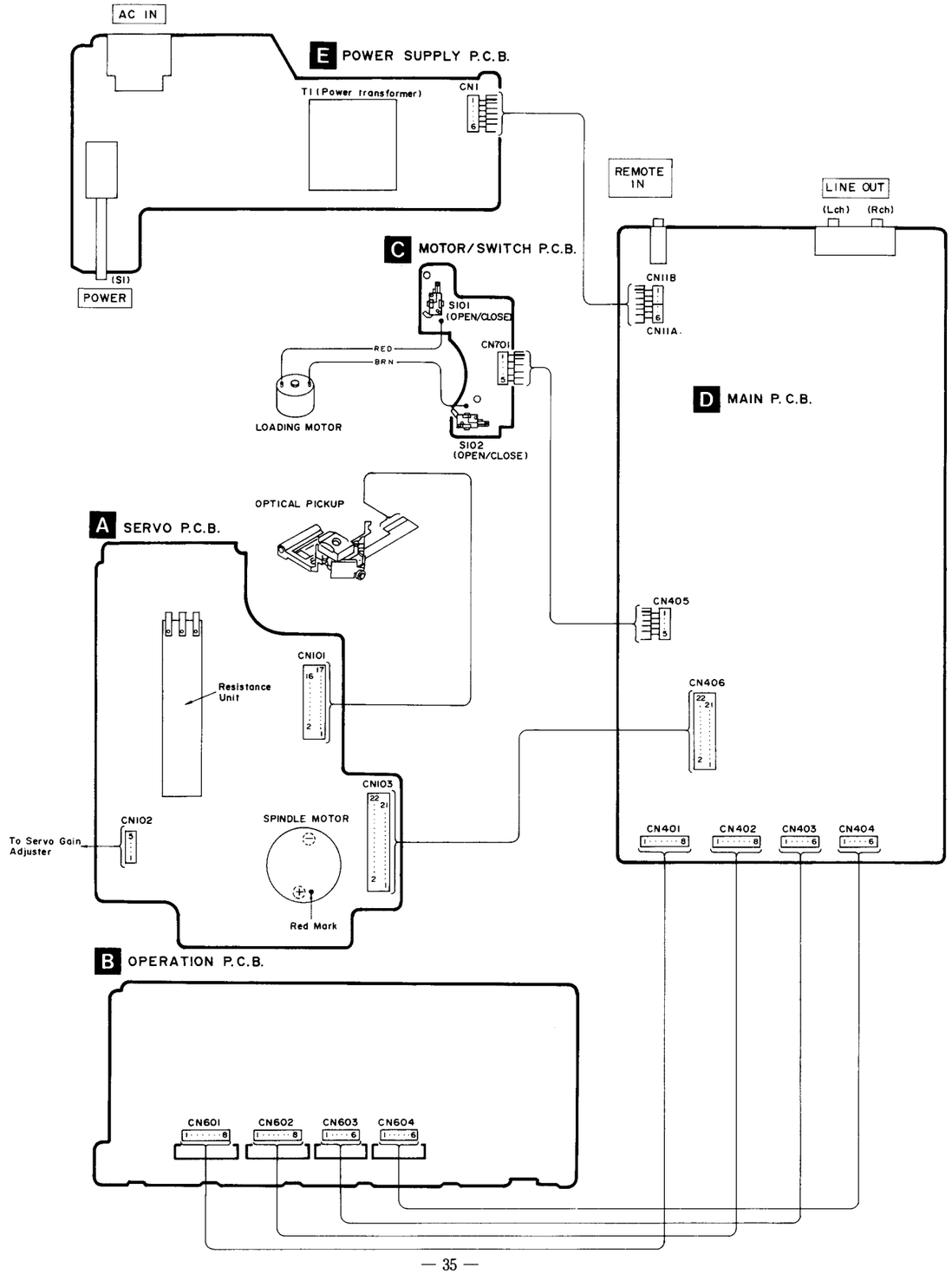
E POWER SUPPLY P.C.B. FOR (E) AREA.



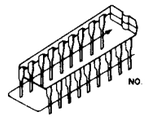
E POWER SUPPLY P.C.B. FOR (GN) AREA.



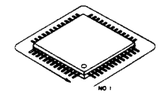
■ WIRING CONNECTION DIAGRAM



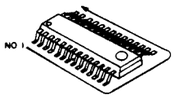
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



MN15283PKG	64 Pin

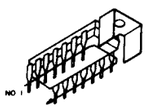


MN6625	64 Pin

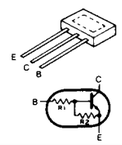


AN8373S	42 Pin	MN1550PKH	18 Pin
AN8374S		LC3517BML15T	24 Pin
BA4558FTI	8 Pin	SM5807ESET	16 Pin
LM833M63		UPD6376GSE1	

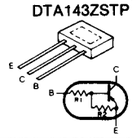
AN8377N	16 Pin

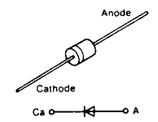


DTC124ESTP

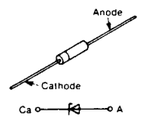


DTA114ESTP,
DTA124ESTP,
DTA143ZSTP



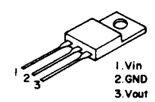


1SS254TA,
SVDS5688GT3

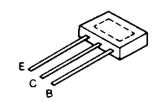


MA4039HTA,
MA4062HTA,
MA4082MTA,
MA4051MTA,
MA4330MTA,
MA4091MTA

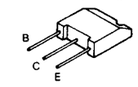
LM2940T5M



2SC3311QRSTA,
2SD1450RSTTA,
2SD1991AQSTA



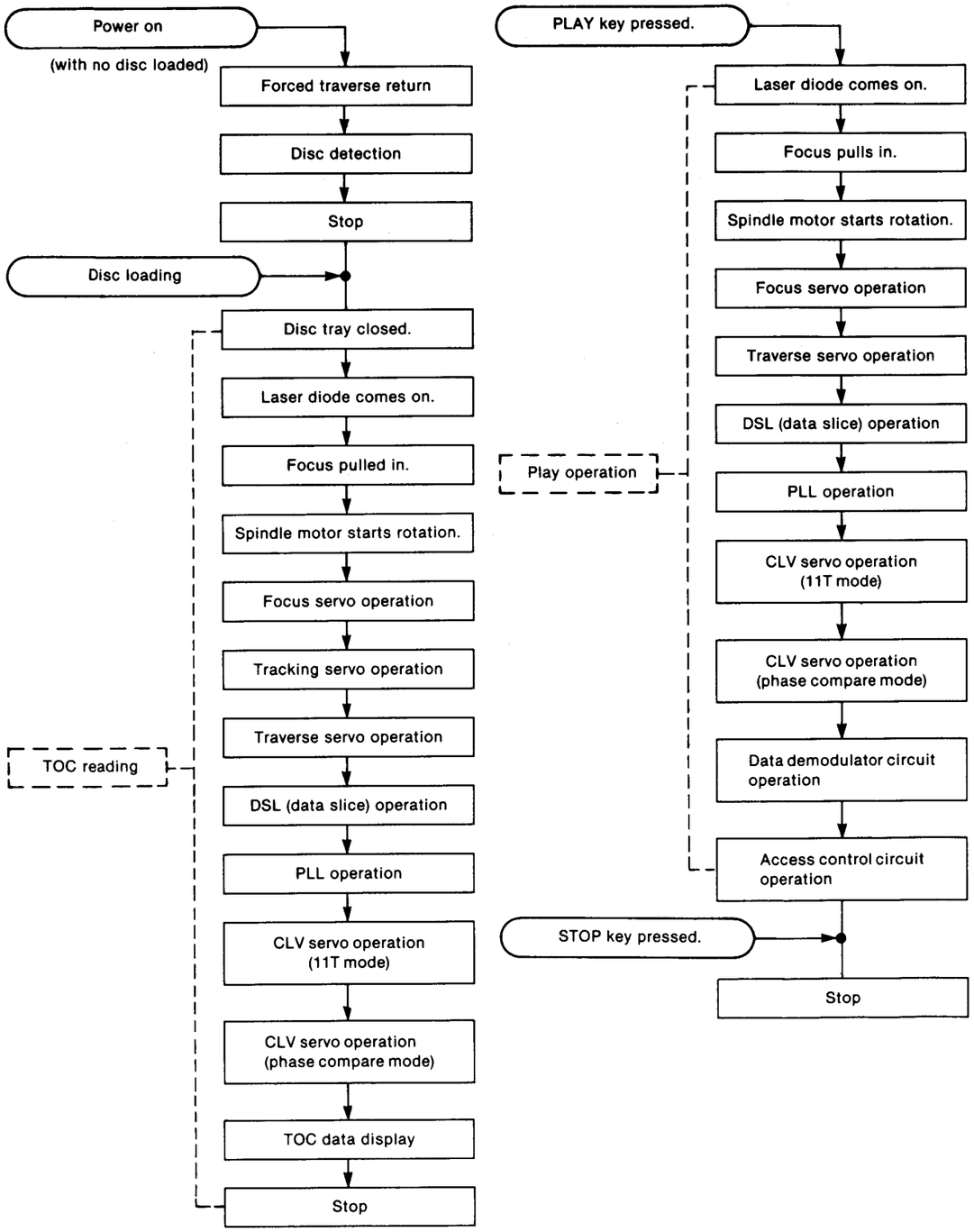
2SB1238QSTV6,
2SD1862QRTV6,
2SB1240QRTV6,
2SA1547QSTV2



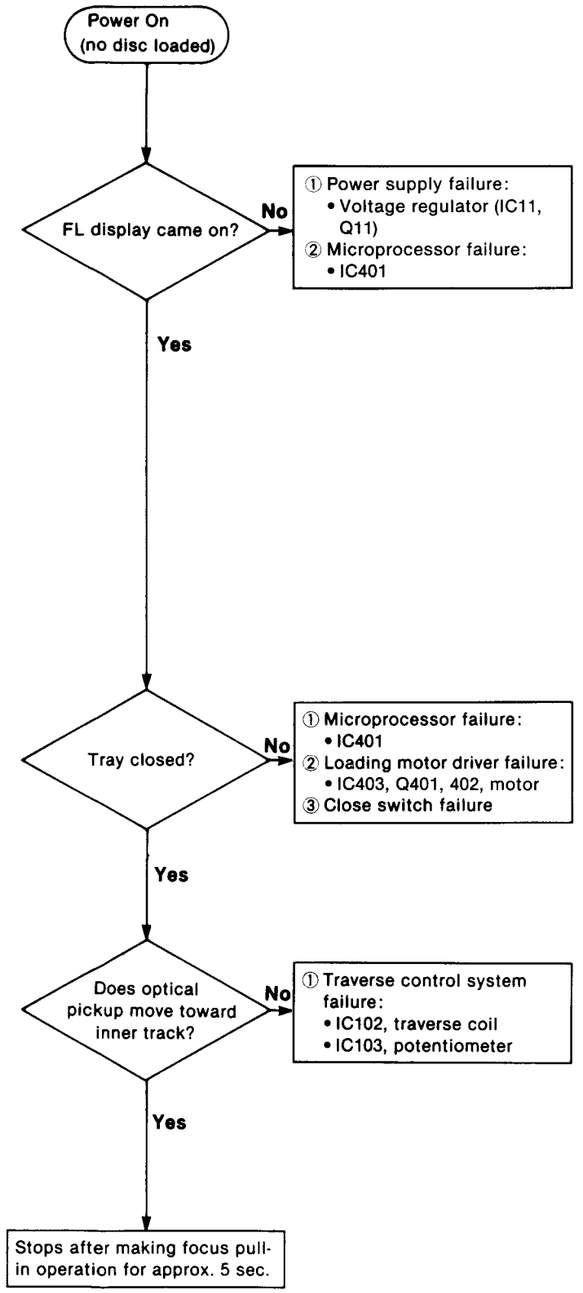
■ TROUBLESHOOTING GUIDE

SL-PJ324 Operation Sequence Check Sheet

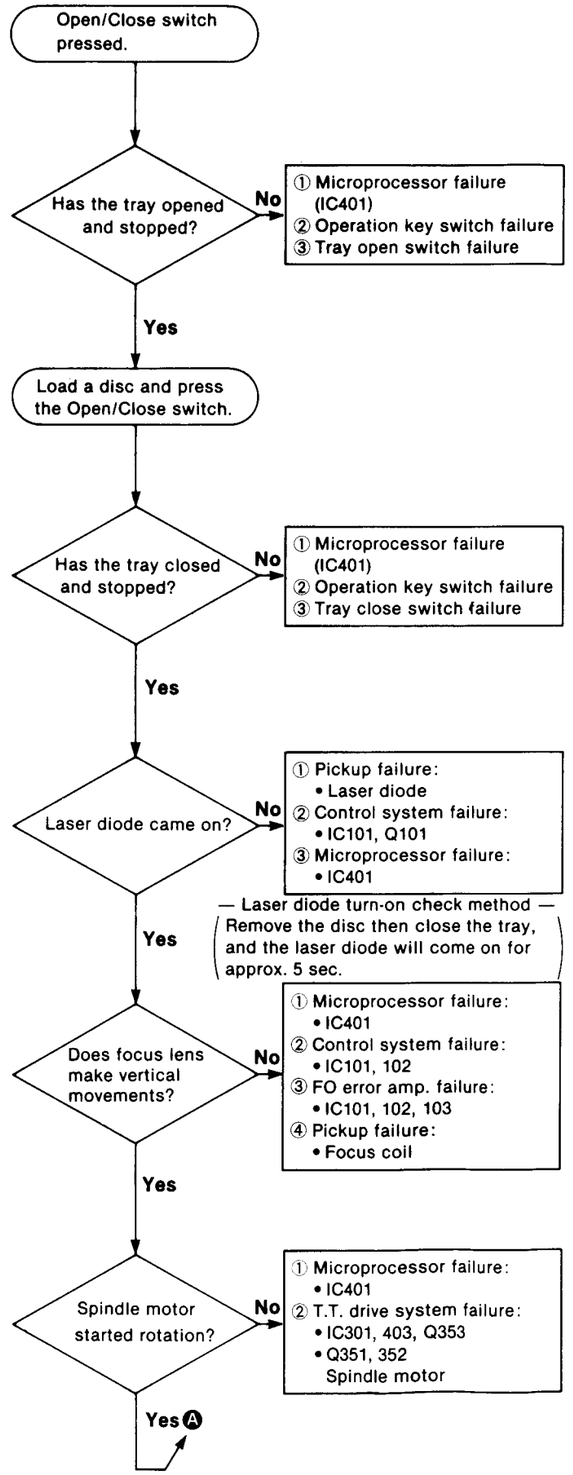
Play Operation Sequence

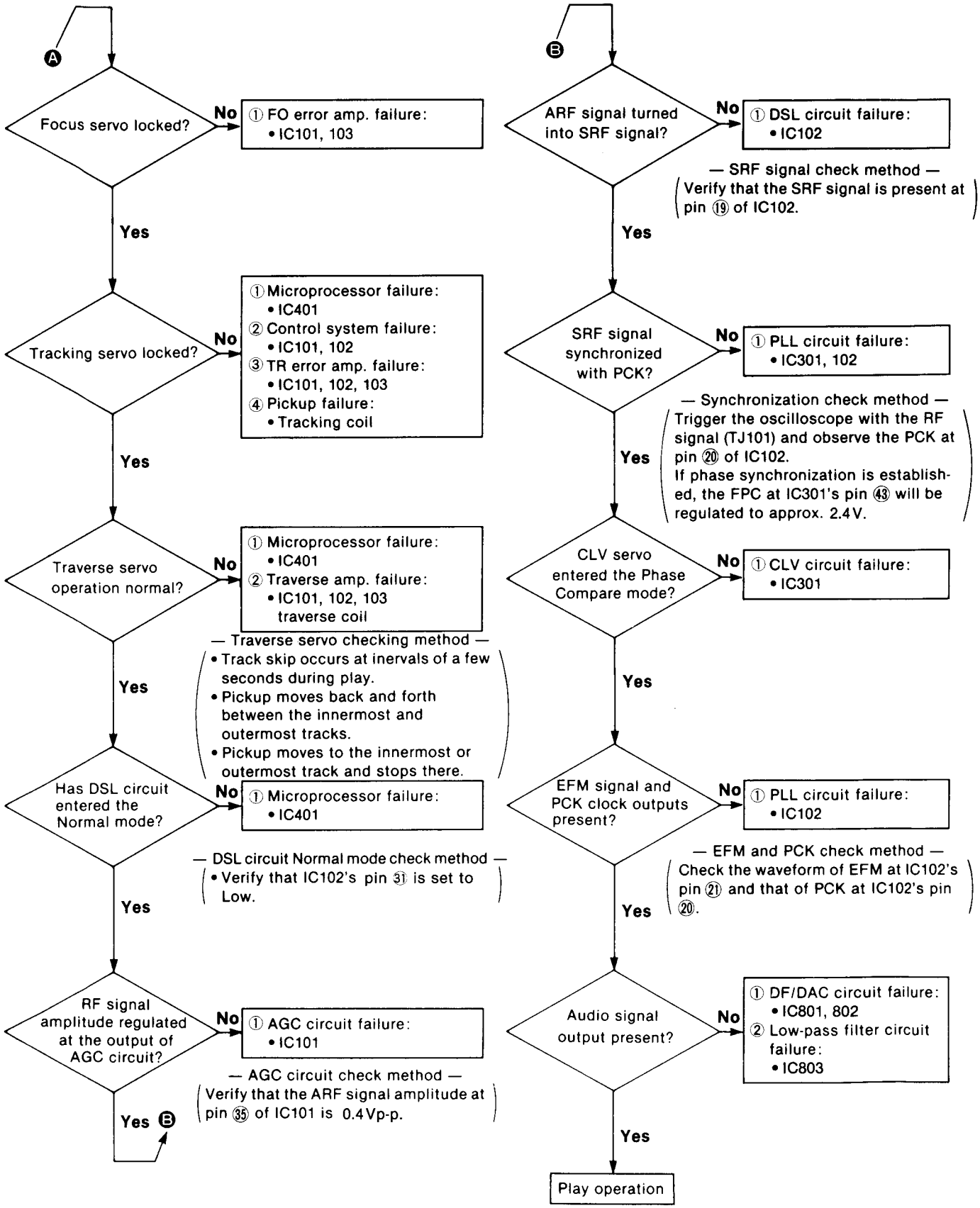


(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)




Ⓐ
Focus servo locked?
No
① FO error amp. failure:
• IC101, 103
Yes
Tracking servo locked?
No
① Microprocessor failure:
• IC401
② Control system failure:
• IC101, 102
③ TR error amp. failure:
• IC101, 102, 103
④ Pickup failure:
• Tracking coil
Yes
Traverse servo operation normal?
No
① Microprocessor failure:
• IC401
② Traverse amp. failure:
• IC101, 102, 103
traverse coil
— Traverse servo checking method —
• Track skip occurs at inervals of a few seconds during play.
• Pickup moves back and forth between the innermost and outermost tracks.
• Pickup moves to the innermost or outermost track and stops there.
Yes
Has DSL circuit entered the Normal mode?
No
① Microprocessor failure:
• IC401
— DSL circuit Normal mode check method —
• Verify that IC102's pin ㉛ is set to Low.
Yes
RF signal amplitude regulated at the output of AGC circuit?
No
① AGC circuit failure:
• IC101
— AGC circuit check method —
Verify that the ARF signal amplitude at pin ㉟ of IC101 is 0.4Vp-p.
Yes Ⓑ
Ⓑ
ARF signal turned into SRF signal?
No
① DSL circuit failure:
• IC102
— SRF signal check method —
Verify that the SRF signal is present at pin ⑲ of IC102.
Yes
SRF signal synchronized with PCK?
No
① PLL circuit failure:
• IC301, 102
— Synchronization check method —
Trigger the oscilloscope with the RF signal (TJ101) and observe the PCK at pin ⑳ of IC102.
If phase synchronization is established, the FPC at IC301's pin ㊸ will be regulated to approx. 2.4V.
Yes
CLV servo entered the Phase Compare mode?
No
① CLV circuit failure:
• IC301
Yes
EFM signal and PCK clock outputs present?
No
① PLL circuit failure:
• IC102
— EFM and PCK check method —
Check the waveform of EFM at IC102's pin ㉑ and that of PCK at IC102's pin ⑳.
Yes
Audio signal output present?
No
① DF/DAC circuit failure:
• IC801, 802
② Low-pass filter circuit failure:
• IC803
Yes
Play operation

■ REPLACEMENT PARTS LIST

Notes : * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
* Warning: This product uses a laser diode. Refer to caution statements on page 3.
* ACHTUNG:
Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC11	LM2940T5M	IC, REGULATOR	
IC301	MN6625	IC, DIGITAL S. P.	
IC302	LC3517BML15T	IC, 16K RAM	
IC401	MN15283PKG	IC, SYSTEM CONTROL&FL DRIVE	
IC402	MN1550PKH	IC, REMOTE CONTROL S. P	
IC403	BA4558FT1	IC, MOTOR DRIVE	
IC801	SM5807ESET	IC, DIGITAL FILTER	
IC802	UPD6376GSE1	IC, D/A CONVERTER	
IC803	LM833M63	IC, L. P. F	
		TRANSISTOR(S)	
Q11	2SB1238QSTV6	TRANSISTOR	
Q351	2SD1862QRTV6	TRANSISTOR	
Q352	2SB1240QRTV6	TRANSISTOR	
Q353	DTA124ESTP	TRANSISTOR	
Q401	2SD1862QRTV6	TRANSISTOR	
Q402	2SB1240QRTV6	TRANSISTOR	
Q404	DTA143ZSTP	TRANSISTOR	
Q405	DTC124ESTP	TRANSISTOR	
Q407, 408	2SC3311QRSTA	TRANSISTOR	
Q601	2SD1991AQSTA	TRANSISTOR	
Q603-605	2SD1991AQSTA	TRANSISTOR	
Q607	2SD1991AQSTA	TRANSISTOR	
Q801, 802	2SC3311QRSTA	TRANSISTOR	
Q803, 804	2SD1450RSTTA	TRANSISTOR	
Q851	DTA124ESTP	TRANSISTOR	
Q853	DTA124ESTP	TRANSISTOR	
Q854	DTC124ESTP	TRANSISTOR	
Q855	DTA114ESTP	TRANSISTOR	
		DIODE(S)	
D11-14	SVDS5688GT3	DIODE	⚠
D15	MA4062HTA	DIODE	
D16-19	SVDS5688GT3	DIODE	⚠
D20	MA4330MTA	DIODE	
D21	MA4082MTA	DIODE	
D22	MA4062HTA	DIODE	
D351, 352	MA4051MTA	DIODE	
D402-406	1SS254TA	DIODE	
D407	MA4039HTA	DIODE	
D409	1SS254TA	DIODE	
D410	MA4091MTA	DIODE	

Ref. No.	Part No.	Part Name & Description	Remarks
D411	1SS254TA	DIODE	
D601-606	1SS254TA	DIODE	
D801, 802	1SS254TA	DIODE	
D851-854	1SS254TA	DIODE	
		COIL(S)	
L1, 2	SLQX400-D	COIL	⚠
L302	ELEXT2R2KA9	COIL	
L402	ELEXT3R3KA9	COIL	
L406	ELEXT3R3KA9	COIL	
L803	ELEXT3R3KA9	COIL	
		TRANSFORMER(S)	
T1	SLTD5K097SE	POWER TRANSFORMER	⚠(E)
T1	SLTD5K099SX	POWER TRANSFORMER	⚠(GC)
T1	SLTD5K098SG	POWER TRANSFORMER	⚠(GN)
		FUSE(S)	
F1	XBA2C012TB0	FUSE	⚠(E, GN)
F1	XBA2C025TB0	FUSE	⚠(GC)
		OSCILLATOR(S)	
X301	SVQAT1693ATA	OSCILLATOR	
		DISPLAY TUBE	
FL601	RSL0052-F	DISPLAY TUBE	
		SWITCH(ES)	
S1	ESB8249V	SW, POWER	⚠
S2	SSR187-1	SW, VOLTAGE SELECTOR	⚠(GC)
S101	SSPD17-1	SW, LOADING DET.	
S102	SSPD18-1	SW, LOADING DET.	
S601	EVQ21405R	SW, OPEN/CLOSE	
S602	EVQ21405R	SW, STOP	
S603	EVQ21405R	SW, REPEAT	
S604	EVQ21405R	SW, PAUSE	
S605	EVQ21405R	SW, PLAY	
S606	EVQ21405R	SW, B. SEARCH	
S607	EVQ21405R	SW, F. SEARCH	
S608	EVQ21405R	SW, B. SKIP	
S609	EVQ21405R	SW, F. SKIP	

Ref. No.	Part No.	Part Name & Description	Remarks
S610	EVQ21405R	SW, TIME	
S611	EVQ21405R	SW, PROGRAM	
S612	EVQ21405R	SW, CLEAR	
S613	EVQ21405R	SW, A. CUE	
S614	EVQ21405R	SW, SIDE A/B	
S615	EVQ21405R	SW, EDIT	
		CONNECTOR(S) & SOCKET(S)	
CN401, 402	RJU003K008M1	SOCKET(8P)	
CN403, 404	RJU003K006M1	SOCKET(6P)	
CN405	RJS1A1705	CONNECTOR(5P)	
CN406	SJSD2221	CONNECTOR(22P)	
CN601, 602	RJT003K008M1	CONNECTOR(8P)	
CN603, 604	RJT003K006M1	CONNECTOR(6P)	
CN11A, 11B	RJS1A1703	CONNECTOR (3P)	
		FLAT CABLE(S)	
FC1	RWJ1806090KQ	FLAT CABLE(6P)	
		JACK(S)	
JK402	RJJ33TR01	JACK, REMOTE IN	
JK801	RJH3201N	JACK, LINE OUT	
		<SERVO P. C. B>	
		INTEGRATED CIRCUITS	
IC101	AN8373S	IC, SERVO AMP	
IC102	AN8374S	IC, SERVO PROCESSOR	
IC103	AN8377N	IC, B. T. L DRIVE	
		<SERVO P. C. B. >	
		TRANSISTORS	
Q101	2SA1547QSTV2	TRANSISTOR	
Q102	2SB1240QRTV6	TRANSISTOR	
		<SERVO P. C. B>	
		VARIABLE RESISTORS	
VR101	EVND3AA00B14	V. R, BEST EYE ADJ.	
VR102	EVND3AA00B14	V. R, TRACKING GAIN ADJ.	
VR103	EVND3AA00B14	V. R, TRACKING OFFSET ADJ.	
VR104	EVND3AA00B14	V. R, FOCUS GAIN ADJ.	
VR105	EVND3AA00B14	V. R, FOCUS OFFSET ADJ.	
VR106	EVND3AA00B24	V. R, TRACKING BALANCE ADJ.	
		<SERVO P. C. B>	
		MAGNET RESISTOR ELEMENTS	

Ref. No.	Part No.	Part Name & Description	Remarks
RA1	EWS7M0A00Q53	RESISTANCE UNIT	

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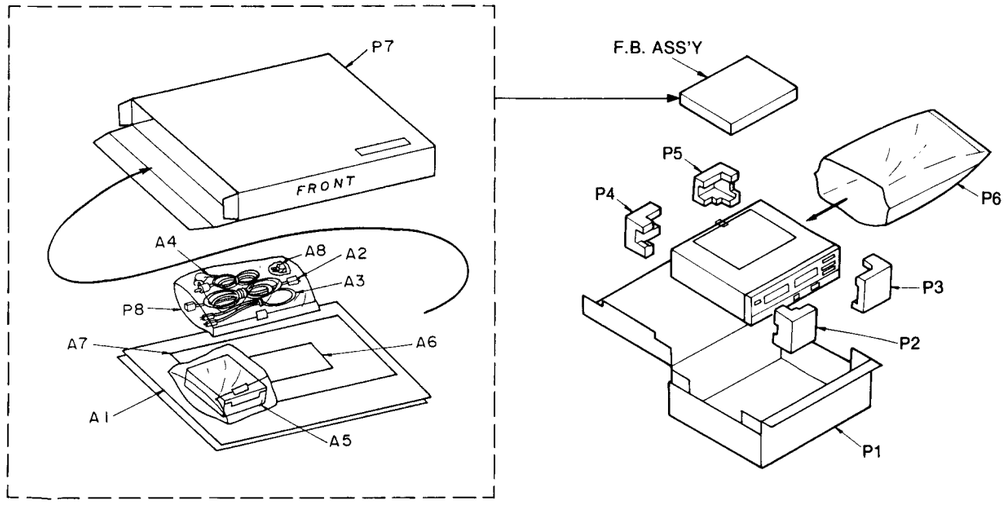
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RKM0015-1K	TOP CASE	
2	SJS9236	AC INLET	⚠(E, GC)
2	SJSD16	AC INLET(JK1)	⚠(GN)
3	SJT390	FUSE HOLDER	⚠
4	RGK0057B	TRAY ORNAMENT	
5	RGR0011L-F	REAR PANEL	(E)
5	RGR0011M-C	REAR PANEL	(GC)
5	RGR0011L-D	REAR PANEL	(GN)
6	RKA0011A	FOOT	
7	RMK0031-2	CHASSIS	
8	RMR0084	POWER SW ROD	
9	RMR0264	FL HOLDER	
10	SUSD144	EARTH CONTACT	
11	RFKGLPJ324E	FRONT PANEL ASS'Y	
11-1	RKW0104	WINDOW	
12	RGU0096A	EDIT BUTTON	
13	RGU0329	SKIP BUTTON	
14	RGU0330	PROGRAM BUTTON	
15	SBC666-1	POWER BUTTON	
16	SHE185-2	P. C. B. SUPPORT	
		SCREW(S)	
N1	RHD30007	SCREW	
N2	XTBS3+8JFZ1	SCREW	
N3	XTB3+8JFZ	SCREW	
N4	XTB3+16JFZ	SCREW	
N5	XTB3+8F	SCREW	
		TRAVERSE DECK	
101	RFKNLP370PAK	DISC TRAY ASS'Y	
102	RMQ0044	PIN	
103	SHRD150	ROLLER HOLDER	
104	SDRD12	ROLLER	
105	SUSD83	SPRING	
106	SIRD96-1	LOCK LEVER	
107	SFUMZ15R61	WASHER	
108	SIRD98-3	DISC TRAY	
109	SIRD107-1	TRAY BASE	
110	SNSD36	SCREW	
111	SIRD40-2	RACK GEAR	
112	SIRD42-5	CLAMPER	
113	SOYD2	CLAMPER YOKE	

Ref. No.	Part No.	Part Name & Description	Remarks
114	SOMD4	CLAMPER MAGNET	
115	SIRD51-1	CLAMPER HOLDER	
116	SDOD29-2	RING	
117	SRQA010N04	SPRING	
118	SDOD28-1E	TURNTABLE	
118-1	XXE26D5	SCREW	
119	SISD22-1	TRAVERSE BASE	
120	SHGD148	STOPPER RUBBER	
121	XYN2+C8	SCREW	
122	SHGD153-1	CUSHION RUBBER	
123	SUSD137-1	SPRING(B)	
124	SUSD136-1	SPRING(A)	
125	SUSD145-1	SPRING(C)	
126	SNSD33	SCREW	
127	SJGDRF310T-2	SPINDLE MOTOR	
128	SHRD177-1	LOCK UNIT	
129	SUXD123-1	GUIDE SHAFT	
130	SUWD112	GUIDE SHAFT HOLDER	
131	XTB3+10G	SCREW	
132	SOYD21-E	YOKE(A)	
133	SOYD22	YOKE(B)	
134	SORD38-E	COIL	
135	SOAD70A	OPTICAL PICKUP	⚠
136	SHWD33	WASHER	
137	SORD37	ROLLER	
138	SHWD34	WASHER	
139	SNSD31	SCREW	
140	SHRD176-E	COIL HOLDER	
141	XTB2+5G	SCREW	
142	RFKNLP370PBK	LOADING BASE ASS'Y	
143	SMBD7-2	BELT	
144	XYN26+F7	SCREW	
145	RMG0050	MOTOR RUBBER	
146	SIRD94-E	LOADING MOTOR ASS'Y	
147	SIKD150051F	FLAT CABLE	
148	XTB3+8G	SCREW	
149	EMCS0552MP	CONNECTOR(5P)	
150	SJSD1722M	SOCKET(17P)	
151	SJSD2222M	SOCKET(22P)	
152	SIKD150221-1	FLAT CABLE	
		PACKING MATERIAL	
P1	RPG0434	PACKING CASE	
P2	RPN0101A	PAD(F. L)	
P3	RPN0101B	PAD(F. R)	
P4	RPN0101C	PAD(B. L)	

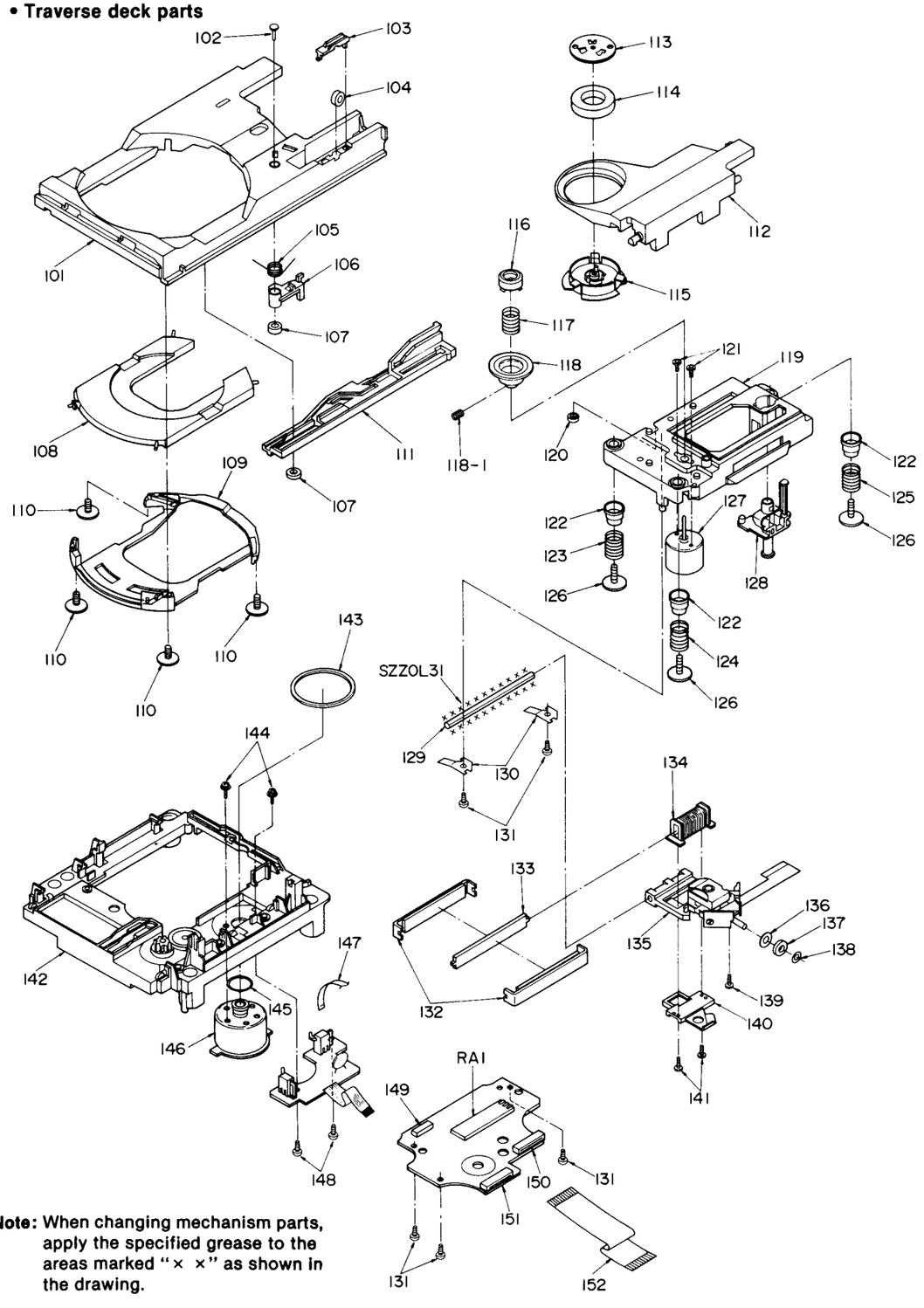
Ref. No.	Part No.	Part Name & Description	Remarks
P5	RPN0101D	PAD(B. R)	
P6	XZB60X60A01	PROTECTION BAG(UNIT)	
P7	SPSD152	ACCESSORIES BOX	
P8	XZB23X20C03	PROTECTION BAG(CORD)	
		ACCESSORIES	
A1	RQT0409-G	INSTRUCTION MANUAL	(GC, GN)
A1	RFKSLPJ324E	INST. MANUAL ASS'Y	(E)
A2	SFDAC05E03	POWER CORD	(E)⚠
A2	RJA0004	POWER CORD	(GC)⚠
A2	SJA173	POWER CORD	(GN)⚠
A3	SJP2249-3	OUTPUT CORD	
A4	SJP2257T	M3 CORD	
A5	RFA0011-1	CABINET EXTENDER	
A5-1	RMA0066	BASE	
A5-2	XTB3+8JFZ	SCREW	
A6	RQA0013	WARRANTY CARD	(E)
A6	SQX7186	WARRANTY CARD	(GN)
A7	RQCB0169	SERVICENTER LIST	
A8	SJP9215	AC PLUG ADAPTER	(GC)⚠

■ PACKING



■ EXPLODED VIEWS

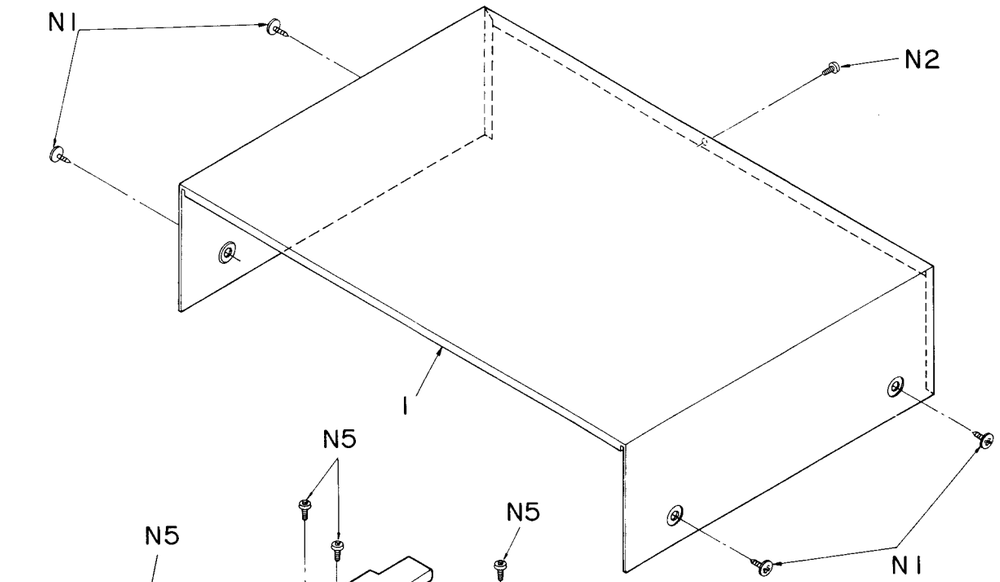
• **Traverse deck parts**



Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

6 7 8 9 10 11 12 13 14

•Cabinet and chassis parts



■ RESISTORS & CAPACITORS

Notes : * Capacity valuse are in microfarads (uF) unless specified otherwise, P=Pico-farads(pF) F=Farads(F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R10-13	ERDS2TJ331T	1/4W 330
R15	ERDS2TJ102T	1/4W 1K
R16	ERDS2TJ120T	1/4W 12
R301	ERDS2TJ121T	1/4W 120
R302	ERDS2TJ101T	1/4W 100
R351	ERDS2TJ103T	1/4W 10K
R352	ERDS2TJ154T	1/4W 150K
R353	ERDS2TJ123T	1/4W 12K
R354	ERDS2TJ154T	1/4W 150K
R355, 356	ERDS2TJ333T	1/4W 33K
R357	ERDS2TJ8R2T	1/4W 8.2
R358, 359	ERDS2TJ101T	1/4W 100
R401	ERDS2TJ472T	1/4W 4.7K
R402	ERDS2TJ913T	1/4W 91K
R403	ERDS2TJ472T	1/4W 4.7K
R404	ERDS2TJ913T	1/4W 91K
R405, 406	ERDS2TJ124T	1/4W 120K
R407	ERDS2TJ101T	1/4W 100
R408-410	ERDS2TJ472T	1/4W 4.7K
R411	ERDS2TJ104T	1/4W 100K
R413-416	ERDS2TJ222T	1/4W 2.2K
R417	ERDS2TJ473T	1/4W 47K
R418, 419	ERDS2TJ472T	1/4W 4.7K
R422	ERDS2TJ103T	1/4W 10K
R423	ERDS2TJ221T	1/4W 220
R424-426	ERDS2TJ472T	1/4W 4.7K
R428-430	ERDS2TJ472T	1/4W 4.7K
R431-434	ERDS2TJ103T	1/4W 10K
R435	ERDS2TJ472T	1/4W 4.7K
R436	ERDS2TJ273T	1/4W 27K
R438	ERDS2TJ100T	1/4W 10
R440	ERDS2TJ332T	1/4W 3.3K
R601	ERDS2TJ102T	1/4W 1K
R603-605	ERDS2TJ102T	1/4W 1K
R607	ERDS2TJ102T	1/4W 1K
R608-612	ERDS2TJ223T	1/4W 22K
R801	ERDS2TJ561T	1/4W 560
R802-804	ERDS2TJ102T	1/4W 1K
R805, 806	ERDS2TJ104T	1/4W 100K
R807, 808	ERDS2TJ333T	1/4W 33K
R809, 810	ERDS2TJ273T	1/4W 27K
R811, 812	ERDS2TJ683T	1/4W 68K
R813, 814	ERDS2TJ471T	1/4W 470
R815, 816	ERDS2TJ102T	1/4W 1K
R821, 822	ERDS2TJ471T	1/4W 470
R823, 824	ERDS2TJ472T	1/4W 4.7K
R825, 826	ERDS2TJ471T	1/4W 470
R852	ERDS2TJ472T	1/4W 4.7K
R854	ERDS2TJ472T	1/4W 4.7K
R855, 856	ERDS2TJ102T	1/4W 1K
R857	ERDS2TJ471T	1/4W 470
		CAPACITORS
C1 ⚠	ECKDKC103PF2	400V 0.01U
C10	ECEA1CU222E	16V 2200U
C11	ECEA1CU102B	16V 1000U
C12	ECEA1CU221B	16V 220U
C15	ECEA0JK470B	6.3V 47U
C16, 17	ECEA1CU331B	16V 330U
C18, 19	ECEA1VU101B	35V 100U
C20	ECFR1E104ZF5	25V 0.1U
C21, 22	ECKR1H103ZF5	50V 0.01U
C24	ECEA1CU221B	16V 220U
C25	ECBT1E103ZF5	25V 0.01U
C301	ECFR1E104ZF5	25V 0.1U
C302	ECBT1H6R8K5	50V 6.8P
C303	ECBT1H220J5	50V 22P
C304	ECFR1E104ZF5	25V 0.1U
C351-353	ECBT1H102KB5	50V 1000P
C401	ECEA0JK470B	6.3V 47U
C402	ECFR1E104ZF5	25V 0.1U
C404	ECBT1E103ZF5	25V 0.01U
C406	ECFR1E104ZF5	25V 0.1U
C407	ECBT1H220J5	50V 22P
C408, 409	ECFR1E104ZF5	25V 0.1U
C410	ECEA1HK010B	50V 1U
C411	ECBT1H102KB5	50V 1000P
C420	ECKW1H103KB5	50V 0.01U
C602	ECBT1H102KB5	50V 1000P
C603-605	ECBT1H101KB5	50V 100P
C801, 802	ECEA1AU101B	10V 100U
C803	ECFR1E104ZF5	25V 0.1U
C805	ECFR1E104ZF5	25V 0.1U
C806, 807	ECEA0JK470B	6.3V 47U
C809, 810	ECQM1H333KF3	50V 0.033U
C811, 812	ECQM1H102KF3	50V 1000P
C813, 814	ECBT1H220J5	50V 22P
C815, 816	ECEA1AN220SB	10V 22U
C817, 818	ECBT1H102KB5	50V 1000P
C819, 820	ECEA1CK100B	16V 10U
C821	ECFR1E104ZF5	25V 0.1U
C851	ECEA1CK100B	16V 10U
C852	ECEA0JU471B	6.3V 470U

Ref. No.	Part No.	Values & Remarks
		RESISTORS<SERVO P.C.B.>
R101	ERDS2TJ471	1/4W 470
R102	ERJ6GEYJ120V	1/10W 12
R103	ERJ6GEYJ122	1/10W 1.2K
R104	ERJ6GEYJ471	1/10W 470
R105, 106	RRJ6GCJ102TE	1/6W 1K
R108	ERJ6GEYJ224V	1/10W 220K
R110	ERDS2TJ222	1/4W 2.2K
R111	ERJ6GEYJ154V	1/10W 150K
R113	ERJ6GEYJ472V	1/10W 4.7K
R114	ERJ6GEYJ683V	1/10W 68K
R116	ERJ6GEYJ332V	1/10W 3.3K
R117	ERJ6GEYJ123	1/10W 12K
R118	ERJ6GEYJ333V	1/10W 33K
R119	RRJ6GCJ223TE	1/6W 22K
R122	ERDS2TJ104	1/4W 100K
R123	ERJ6GEYJ470V	1/10W 47
R124	RRJ6GCJ103TE	1/6W 10K
R125	RRJ6GCJ222TE	1/6W 2.2K
R127	ERDS2TJ681	1/4W 680
R128	RRJ6GCJ103TE	1/6W 10K
		CAPACITORS<SERVO P.C.B>
C101	ECEA1CKS220I	16V 22U
C102	ECEA1HKS010I	50V 1U
C103	ECEA1CKS220I	16V 22U
C106	RCUV1E104ZF	25V 0.1U
C107	ECEA0GKS101I	4V 100U
C108	ECEA0JKS470I	6.3V 47U
C109	ECEA1HKS010I	50V 1U
C110	RCUV1H681KB	50V 680P
C111	ECUV1C224KR	16V 0.22U
C112	RCUV1H331KB	50V 330P
C113	ECEA1HSN010I	50V 1U
C114	RCUV1E333KB	25V 0.033U
C115	ECEA1HSN010I	50V 1U
C116	RCUV1E333KB	25V 0.033U
C117	ECBT1H102KB5	50V 0.001U
C119, 120	ECEA1CKN4R7I	16V 4.7U
C122	ECEA0JKS220I	6.3V 22U
C123	RCUV1E104ZF	25V 0.1U
C124	ECUV1E823KB	25V 0.082U
C125	ECUV1C224KR	16V 0.22U
C127	ECEA0JKF101I	6.3V 100U
C128	ECEA1CKA101I	16V 100U
C132	ECUV1E104KB	25V 0.1U
C133	RCUV1H330KC	50V 33P

Ref. No.	Part No.	Values & Remarks
C134, 135	ECUV1C224KR	16V 0.22U
C136	ECEA0GKS101I	4V 100U
C138	RCUV1E104ZF	25V 0.1U
C139	RCUV1H470KC	50V 47P
C140	RCUV1E103KB	25V 0.01U
C141-144	RCUV1H470KC	50V 47P
C145	ECEA0JKF101I	6.3V 100U
C146	RCUV1H181KC	50V 180P
C147	RCUV1H472KB	50V 4700P
C148	ECEA1ESN4R7I	25V 4.7U
C149	RCUV1E104ZF	25V 0.1U
C150	RCUV1E103KB	25V 0.01U

Printed in Japan
H900403500 YY/TN